

Ex-Post Evaluation Report

**Shanghai Modern Molding Technology
Training Center Project in China**

September 2002

**Japan International Cooperation Agency
Planning and Evaluation Department**

The opinions expressed in this report are those of the authors and do not necessarily represent the views of the Japan International Cooperation Agency (JICA).

CONTENTS

Preface

Photos

1. The Outline of the Ex-post Evaluation Study	1
1.1 Background and the Purpose of the Study	1
1.2 Evaluation Team and the Study Period	1
2. Study Methods	2
2.1 PDMe	2
2.2 Stakeholders and Study Methods	2
3. Study Results	3
3.1 Sustainability	3
3.1.1 Current Situation of Counterpart Personnel	3
3.1.2 Organizational Aspects	4
3.1.3 Financial Aspects	4
3.1.4 Technical Aspects	5
3.1.5 Sustainability of Project Effects	6
3.2 Impact of the Project	9
3.2.1 Impacts Attained by Overall Goals	9
3.2.2 Impact not Anticipated at Project Completion	10
3.3 Analysis of Factors of Impact and Sustainability	10
3.4 Issues, Problems	11
3.5 Conclusion	11
4. Recommendations and Lessons	11
4.1 Recommendations	11
4.2 Lessons	11

Preface

In regard to the ODA evaluation, it has been pointed out that the establishment of a consistent evaluation system from the preliminary stage to ex-post is important. Therefore, JICA has been implementing full-fledged ex-ante evaluations for each project-type technical cooperation project,¹ grant aid project and development study since fiscal 2001 after going through an experimental introduction in fiscal 2000. On the other hand, terminal evaluation has been implemented for each project--mainly project-type technical cooperation projects--in the past. However, the effects arising at a certain period after the end of the cooperation (impacts) and sustainability at that time have not necessarily been verified or analyzed. In order to implement projects more efficiently and effectively, it is important to conduct ex-post evaluation for each project and to also give feedback of the evaluation results to the recipient countries.

Against this background, it was determined that the “ex-post evaluation for individual projects” would be implemented for project-type technical cooperation projects and grant aid projects from fiscal 2002. In preparation for full-fledged implementation, the evaluation was experimentally implemented for Indonesia and China in fiscal 2001. The knowledge acquired through the evaluation was organized to prepare the “Manual for Implementing Ex-post Evaluation for Individual Projects (Compendium of Case Studies).” This report is a compilation of the results of ex-post evaluations for projects that were subject to experimental implementation.²

In the past, the monitoring survey (post-project monitoring) had been carried out for project-type technical cooperation projects, grant aid projects and the independent provision of equipment (already abolished as a cooperation form) at a certain period after the end of cooperation (after two years and six years). Materials acquired through post-project monitoring have been utilized to consider the implementation of follow-up cooperation. The new “ex-post evaluation for individual projects” is a progressive reorganization of the “post-project monitoring.” In the survey, post-project conditions are surveyed and an evaluation is made, as mentioned above, through the more comprehensive survey and analysis of the effects of cooperation and sustainability by the recipient countries.

September 2002

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¹ The name was changed to “technical cooperation project” in fiscal 2002.

² Three ex-post evaluations (two for project-type technical cooperation and one for grant aid cooperation) were implemented in Indonesia and China respectively, and separate reports were made.



Shanghai Modern Molding Technology Training Center



Wire-cutter



Students visiting the center

1. The Outline of the Ex-post Evaluation Study

1.1 Background and the Purpose of the Study

Implementation of this project was requested at the annual consultation meeting held in 1988.

In response to the request, JICA dispatched a Preliminary Survey Team in January 1990 in order to verify the content of the request. Based on the result of the preliminary survey, long-term study team was dispatched to examine the implementation plan in detail. In January 1991, in accordance with the results of the surveys to date, the Implementation Survey Team was sent in order to confirm the implementation plan for the project-type technical cooperation, and signed the Record of Discussions (hereinafter referred to as the R/D). Based upon the R/D, the project was implemented from September , 1991 to August 31, 1995.

The ex-post evaluation study, which is to start in a full scale from FY 2002, has been conducted in China and Indonesia in trial basis. The objectives of this study are to verify mainly the sustainability and impact of some projects after certain periods have past since the completion of JICA cooperation. Through the activities above, this study seek to obtain lessons in order to utilize them to feed back for the formulation of similar projects in the future. The projects were selected based on the following criteria:

- Project-type technical cooperation and grant aid
- Project after 3 to 6 years have past
- Project which was not covered by the ex-post evaluation by Ministry of foreign affairs or JICA in three years

1.2 Evaluation Team and the Study Period

Name	TOR
Takashi Tanaka (JICA China office)	Team leader for this project study
Kazuhiro Yoshida (Office of Evaluation and Post-project Monitoring, Planning and Evaluation Department, JICA Head Office)	Evaluation planning
Tsuyoshi Ito (ICNet Limited)	Analysis of post-project evaluation
Ms. Li Wei (Beijing Manyo Consultants Co. Ltd.)	Analysis of post-project evaluation (local consultant)
Ms. Liu Ran (JICA China Office)	Interpretation, study assistance

Field study in China was carried out from February 24 to March 9, 2002. During this period, field study for this project was carried out on February 27 and 28.

2. Study Methods

2.1 PDMe

Summary	Indicator	MoV	Assumption
Overall goals To improve China's precision mold production technology for plastics.	<ul style="list-style-type: none"> Improvement of technology and productivity in coastal regions. Number of trainees accepted from the central-west region. Improvement of technology and productivity in the central-west region. 	<ul style="list-style-type: none"> Survey study for companies, which sent the trainees. 	Planned as a training and education institute attached to the Shanghai City Second Light Industry Department.
Project purpose Molding Technology Center's ability to provide training for mold production technology is strengthened, and training courses are implemented.	<ul style="list-style-type: none"> Implementation of training courses. 	<ul style="list-style-type: none"> Project documents. 	C/Ps stay at the training center. People from all around the country apply for the training courses.
Output 1. The instructors (C/Ps) learn the mold production skills necessary to give technical instruction in precision mold production technology for plastics. 2. Training courses are implemented. 3. Short-term courses and seminars are implemented. 4. Educational materials are prepared. 5. Instruction trips for private factories are carried out. 6. Technical guidance is held for private corporations.	1.1 Satisfaction of trainees and the companies they are dispatched from. 2.1 Track record of training courses. 2.2 Track record in number of participants. 3.1 Track record in implementing short-term courses and seminars. 3.2 Track record in number of participants at these short-term courses and seminars. 4.1 Number of new educational materials developed 5.1 Track record in the instruction tips. 6.1 Track record in number of the guidance with companies.	1.1 Survey study 2.1 Project documents 2.2 Project documents 3.1 Project documents 3.2 Project documents 4.1 Project documents 5.1 Project documents 6.1 Project documents	

2.2 Stakeholders and Study Methods

In this evaluation study, a study plan and questionnaire were prepared in advance based on the project outcome and anticipated impact described in the final report of the Japan-China joint evaluation study at the project completion. The specific study targets and study methods used in the onsite study are as described below.

This study carried out a survey study to measure the impact on trainees—the ultimate beneficiaries—and the companies that dispatched them. This study was not able to secure a statistically significant sample number due to time constraints (36 former trainees and 19 companies that dispatched the trainees).

Table: Study targets and study methods

Study target	Study method
<u>Responsible agency</u> Shanghai Light Machinery Corporation (previously: Shanghai City Science and Technology Committee, Second Light Machinery Division)	Hearings based on evaluation questionnaires
<u>Implementing agency</u> Shanghai Modern Molding Technology Training Center Shanghai Second Light Machinery School	Request for data collection Hearings based on evaluation questionnaires
<u>Other related institutions and organizations</u> Former trainees Companies that trainees were dispatched from.	Study survey Study survey

3. Study Results

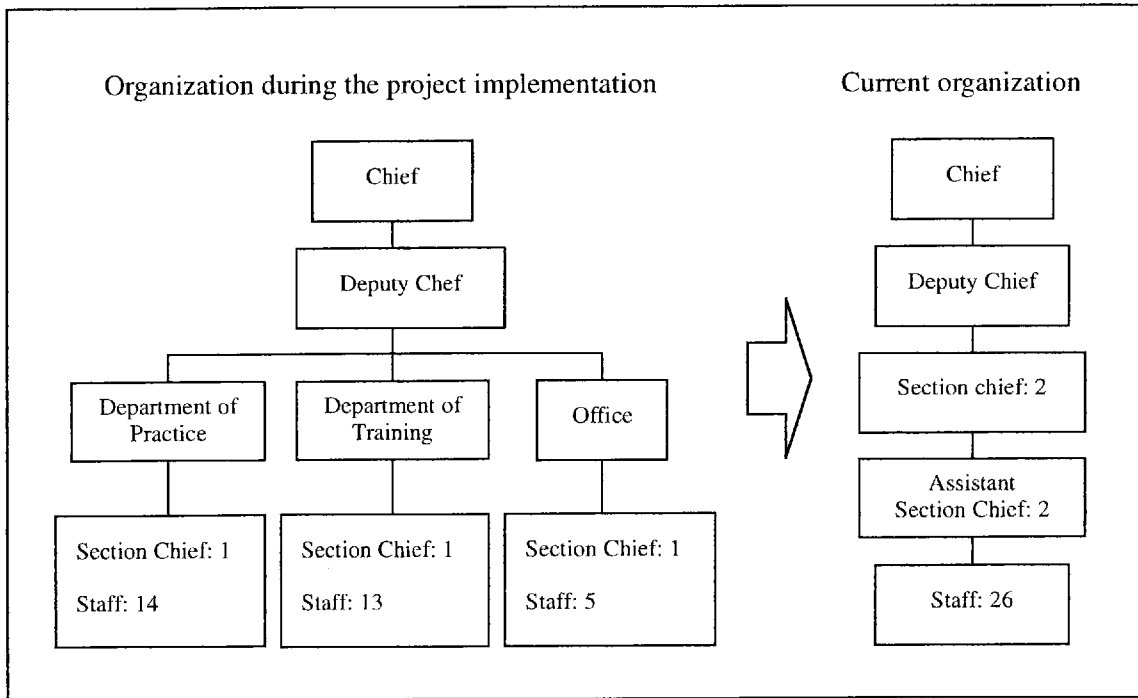
3.1 Sustainability

3.1.1 Current Situation of Counterpart Personnel

There were 37 staff members when the project was being implemented, but there are currently 32 staff members. The organization structure has been simplified as seen in the figure below. The “office” was the one for the Japanese experts during the project implementation, and was abolished when the project was completed. Twenty-two ex-counterparts remained (approximately 59%), and the ex-counterparts occupy all of the six positions above that of Assistant Section Chief—excluding that of Chief—.

Out of the ten counterparts who left the Training Center, four retired. The ex-counterparts are now working in key positions, and some have renewed, consequently, the Training Center has been upholding the staff’s independence as an organization.

Figure: Changes in employee distribution at the Shanghai Modern Molding Technology Training Center



3.1.2 Organizational Aspects

In 1992, while the project was being implemented, the national policy shifted to the privatization, and the project that aimed to improve the technical strength of public companies ought to change their targets to privatized companies. In 1995 the project came under the jurisdiction of the Shanghai Light Manufacturing Corporation. Furthermore, according to the government's domestic aid policies for the central-west regions, Shanghai city is responsible for Henan Province, Yunnan Province, Shaanxi Province and the Autonomous Region of Tibet, so Shanghai must respond to a variety of needs. Despite these changes in external factors, the Training Center has been responded appropriately to these changes.

Currently the Training Center is the assistant chairman of the Shanghai Molding Education and Training Committees as well as a member of the China Molding Industry's Education and Training Association.

3.1.3 Financial Aspects

Shanghai Er-Qing Mechanical Second takes in the finances and apportions the annual budget of the Training Center. The annual budget of the Training Center was 2.95 million yuan in 2001, and of this 1.45 million yuan from the city government and 1.5 million yuan from the school. Ordinary expenditures such as personnel expenses and equipment maintenance expenses are

around 2.5 million yuan and the Training Center does not have its own independent profits.

Fewer students are expected in the coming years due to the children from the beginning of the “one child-one family” policy are reaching school age. Trainees from the central-west area will receive preferential tuition treatment. These two factors indicate falling revenue in the near future, however, the support both from the school and the city government are expected to be stable. Therefore, there will likely be no serious financial problems.

3.1.4 Technical Aspects




After the project completion, texts have been revised. Also, information sources for the latest technical information have seems to be established which include domestic sources, the internet and Japan’s supporting institution (Daiichi Seiko Co., Ltd.). In 1998 large-scale CAD, CAM and CAE software was introduced, and in 1999 instructors participated in CAD and CAM software training courses to improving their technical skills. As a result, the range of capability has expanded from molding manufacturing for daily miscellaneous products, telephone receivers and camera bodies to molding designs for products with complex free-form surfaces.

The Training Center possesses molding manufacturing facilities that are among the most advanced in China. The Center receives very difficult orders, so the instructors are not only gaining the knowledge they need to raise their mold production levels but the real-life experiences they can use in their education.

There have not been any particular problems in the maintenance and management of the facilities and equipment. Since all the equipment for mold production is used both for commissioned work from the outside and training exercises, it was pointed out in the evaluation at project completion that it is essential that ordered work be kept to a reasonable level so as not to inhibit the training activities. The number of external orders had increased 10% at the time of the study (25 cases in 2001 led to a 10% increase in sales, so it is estimated that increase of the work amount is roughly 10% as well). Combined with the evidence that the increase in the number of training courses and trainees, and the fact that trainees did not indicate any problems in their surveys, work balance between the ordered works and training operations has been well controlled.

3.1.5 Sustainability of Project Effects

The sustainability of the Project results from completion to present is expressed below.

( : very high;  : maintained, sustained;  : lower than at completion.)

(1) Training courses are implemented.


Sustainability: 

Table: Fluctuation in track record of training courses implemented after project completion

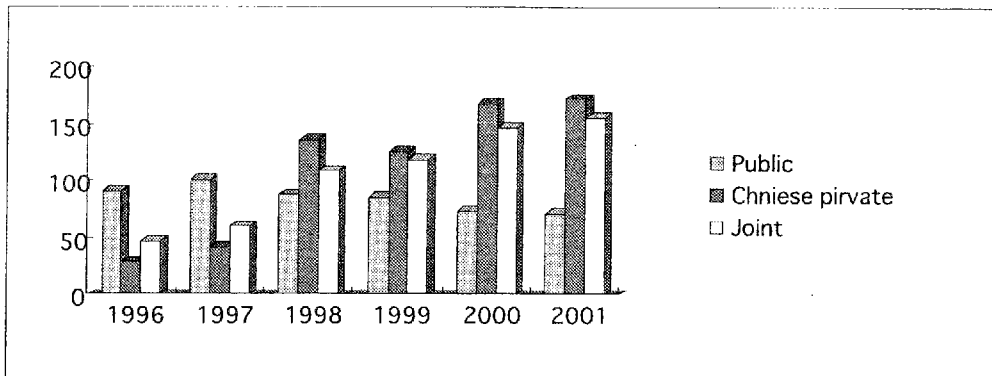
		1 9 9 6	1 9 9 7	1 9 9 8	1 9 9 9	2 0 0 0	2 0 0 1
Training	Mold manufacturing	3 times	3 times	6 times	7 times	7 times	6 times
	Mold design	1 times	1 times	1 times	none	none	none
	3-D design	none	none	none	none	2 times	2 times
Trainees	Total	1 6 7	2 0 2	3 3 3	3 2 8	3 8 6	3 9 8
	Proportion in Shanghai	1 2 7	1 6 1	2 1 7	1 8 9	2 3 9	2 3 8
	Other regions	4 0	4 1	1 1 6	1 3 9	1 4 7	1 6 0

After 1996, the number of courses and trainees both continued to increase. As with the switch from the mold design course to 3-D designing course, the contents of the courses was also developing. The number of trainees grew by approximately three times, to just under 400 in 2000. Approximately 80% of the trainees were participants from private companies (the ratio of Chinese equity to joint stock was about 50:50).

According to the ex-trainee's surveys, almost all (32 out of 33, and three invalid responses) ex-trainees were satisfied (four were extremely satisfied and 18 were generally satisfied). Most requests in regard to the training courses were for longer training periods and an increase in the number of practical training hours.

Due to the privatization of the public companies, the proportion of students from private companies jumped in 1998. This can be attributed to the fact that there were not many public companies interested in paying for training of technicians under the financial difficulties. While the proportion of trainees from public companies fell from 54.4% to 17.8%, the number of trainees from joint companies jumped from 28.5% to 38.9%. The growth in the proportion of trainees from Chinese-equity companies was even more striking, climbing from 17% to 43.2%.

Figure: Fluctuation in type of company dispatching students after project completion



(2) Short-term courses and seminars are implemented.

Sustainability : ↗

Short-term courses are given two or three times annually, similar to the pace maintained during the project, but the number of participants is increasing, with about 150 participants each time (approximately 1.5 times higher). Seminars are being held more frequently, with over ten of them opened in 2000 and 2001 (double the previous rate).

(3) Educational materials are prepared.

Sustainability : ↗

Educational materials were prepared even after project completion. The National Machine Publication Company is interested in publishing a series of these textbooks. The content of the material prepared by the Training Center is as described below:

Table: Education material and training prepared by the Training Center

Textbook editing	Multimedia Learning	Molding learned with models	Technology advances
Plastic mold design	Plastic mold construction.	Molding tools for telephone receiver bodies	Large-scale CAD, CAM and CAE software UG for mold design, adopting for processing
Mold making and processing technique	Facilities and equipment for plastic molding and mold processing.	Mold for camera body	
CNC machine tool coding		Consecutive molds for multi-part processing	
Outline of UG handling	Construction and processing for consecutive molds.	Hydraulic pressure die casting	Use for high-speed processing center
Computer auxiliary design	Equipment for transmissions.	Complex curved body molding	


(4) Instruction trips for private factories are carried out.

Sustainability : — (Insufficient information was secured in this study.)

(5) Instructions and seminars are held at schools and other educational institutions

Sustainability : — (Insufficient information was secured in this study.)

(6) Technical guidance are held for private corporations.

Sustainability : 

More technical guidance is being held, with over 100 cases after 2000 (approximately twice the previous amount). It was not possible to ascertain the exact content of the instructions. The Training Center receives orders for very complex molds from Japanese, U.S. and German joint companies and holds training for the technicians and administrators of these joint companies.

3.2 Impact of the Project

3.2.1 Impacts Attained by Overall Goals

Impact	Yes/No	Current state
Manufacturing technology for precision molds for plastics improves in China's eastern region.	--	The 19 companies involved in mold manufacturing that participated in this study's survey claimed that dispatching employees to the training courses led to spillover effect to other employees in the company and to development of new products. This indicates that there seems to have been an impact to some extent. However, since the sample number was not big enough to ascertain the technical improvement in the region.
Mold technology China's central-west region improves.	No	Shanghai city is responsible for providing Yunnan Province, Henan Province, the Autonomous Region of Tibet and Shaanxi Province with aid. There were only seven trainees from these regions after the project completion until 2001. However, 25 were accepted from the overall central-west region in 2000 and 2001, respectively, so the trend is leading toward an increase. Preparations are being made to admit trainees from the central-west region with preferential tuition.
Changes in the production efficiency and sales of companies from which trainees were dispatched.	Yes	In the responses from the dispatching companies, "technology diffusion to other technicians" was most often given as the most significant effect of the training, and "improved quality" followed in frequency. "Training was linked to development of new products" was the third most common response. Although few companies responded that there were improvements in sales and production efficiency, these responses alone suggest sufficient impact. All companies responded that they would like to send personnel to participate in training in the future. On the other hand, ex-trainees responded in their surveys that facilities and funds were the two biggest problems at the companies they are affiliated with, with the level of technicians being the third most significant. Furthermore, very few responded as "Precision of manufactured products has improved." Given this, more information must be collected on the following points: <ul style="list-style-type: none"> • What proportion of the companies has machinery similar to that of the Training Center? • The reasons for the fact that despite many pointed out that "the level of the technicians is low," number of responses "client needs are not dealt with" and "accuracy is low," which generally linked with the "level of the technicians," were not as many.
Promotions and salary rises of ex-trainees after returning to the dispatching company.	Yes	56% (20 respondents) had salary raises or promotions after the training.

3.2.2 Impact not Anticipated at Project Completion

Impact	Current state
Shanghai Er-Qing Mechanical school's practical training is strengthened.	Shanghai Er-Qing Mechanical school's practical training is conducted at the Training Center, and not only improved the school education's practical training, it also raised the school's name recognition to create an environment that make gathering students easier.
Spillover effects to other mechanical schools.	<p>The Training Center not only holds practical training for the Shanghai City Second Light Machinery School but also for other machinery schools, and contributes in this way to improvements in practical training at other schools.</p> <p>The educational method at the Training Center combining theory and practical training accomplishes the role of the molding education model. Large- and medium-sized institutes (such as vocational high schools, professional schools and junior colleges) offering molding design and specialized manufacturing courses send their instructors and students to the Training Center to have practical training courses—for example, Wuhan Train Industrial Institute, University of Shanghai, Halpin Industrial School, Tianjin Light Industry School and Changzhou Electronics School.</p>

3.3 Analysis of Factors of Impact and Sustainability

Promoting factors

- The Training Center receives stable support from the Science & Technology Commission of Shanghai Municipality, the board of education, and the Light Industry Association. For example, the board of education has provided exclusive funds for molding education on two occasions for a total of 1.98 million yuan. Shanghai Er-Qing Mechanical School invested 1.5 million yuan in the Training Center for introducing additional equipment. JICA provided additional equipment in 2000 as an aftercare project. Due to this external assistance, the Training Center has the most advanced facilities in China and is recognized as a training center that can provide fulfilling practical training. The Training Center and the Shanghai Er-Qing Mechanical School are both independent organizations, but they actually share funding sources and the Shanghai Er-Qing Mechanical School directly supports the Training Center in personnel, finances and supplies. This stable support is the most significant promoting factor in maintaining sustainability and creating impact.
- The Training Center already had high abilities before the project started. This is an important factor in smooth development during the implementation and after the project completion.
- The Center not only conducts training but also maintains relations with companies demanding skills at a high level such as private and joint companies. By accepting these orders the Training Center effectively prevents its own technique from becoming out-of-date.
- Accommodation to external factors (flexibility in management) is also a significant factor.

Inhibiting factors

There were no particular inhibiting factors found in this study.

3.4 Issues, Problems

There were no significant problems found in this study.

3.5 Conclusion

Steady, sustainable development has been achieved. Given that approximately 60% of the 300 to 400 annual graduated trainees are from Shanghai city, impact on a nationwide scale is not yet possible to assess, but the future plan to accept trainees from the central-west region on a preferential basis give the expectation to contribute in the future.

4. Recommendations and Lessons

4.1 Recommendations

- The responsible agency should clarify the exact role and short-term and mid-term goal of the Training Center for the assistance to improve the molding industry in the central-west region, so that the Training Center would be able to establish a specific plan for its role.
- It is necessary to establish the human resources development plan for trainers in response to the change and needs of the society, which leads to the sustainable development of the Training Center.

4.2 Lessons

Lessons relevant to the project formulation of similar projects in the future

- It is best to choose a city that has developed light industry (not only molding, but regions that have a need for high level light industry skill) as a base when creating similar projects. In this case it would be easy to recruit students and the training center could be improved in ways consistent with local needs by receiving actual commissioned work from private companies in the surrounding areas.
- Since the trainees from private companies usually try to apply the knowledge and the skill they learned at the training center soon after, the project relevance and the impact of the technical training for private companies can be ascertained in a comparatively short period of time. On the other hand, since training centers are not under the formal education system, they must advertise and gather trainees independently. Until accomplishments of the center are recognized, number of applicants can be unstable. This particular project provides an example of a way to get around this problem by creating a mutual complementary system through affiliations with the formal school system.
- It is easy for a training center to establish a financial base with revenue from the trainees'

course fees. But, this means financial capacity of a training center is limited by number of trainees, and if mounting facility investments and maintenance/management expenses is necessary for the training operation, it may not be profitable. Also, if company technicians are the primary target rather than general job training, few trainees could be expected at one time, so it is possible that working with formal schools as this Project did can maintain stable finances.

- It is likely that, in this Project, the continuing cooperation from a Japanese supporting company group in providing information supported the sustainability. This example indicates that continuous assistance from a certain Japanese organization, especially for information exchange, would enhance the effect of the project in the long term.

Other lessons

- In this project, the external factors changed during the project implementation (shift in the policies of public companies) and after implementation (Shanghai city's requirement to assist the central-west regions). If the PDM had not been revised during project implementation to reflect the changes, the evaluation at the completion and the post-project evaluation would be misleading, or more difficult. It is therefore essential to establish a monitoring system of the project implementation.