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Transition of Expertise and Adaptation Process in Changing Professional Occupation

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Abstract: This study examines the transitions of expertise, the challenges of changing professional occupation and the process of adaptation after the occupational change from architectural designers/engineers (A/E) to CMRs (Construction Managers) in Japan. To this goal, a framework of expertise for CMR and Kenchikushi is obtained through a literature study. Then, case studies are conducted and the collected five cases are coded to examine the transition of expertise. Furthermore, the adaptation process after the change of professional occupation is modeled using the TEM (Trajectory Equifinality Model).

Key words: profession, expertise, adaptation process, TEM (Trajectory Equifinality Model)

1. INTRODUCTION

The building construction industry has seen the emergence of a number of emerging professions, such as project managers and construction managers, façade engineers, etc., who participate in projects[1]. Such the newly emerging professions are often assumed by existing professionals, especially in the early years of the profession's inception because it takes a long time to develop human resources to meet the rapidly growing demand. In such cases, there are many factors that may or may not facilitate a smooth transition from one professional occupation to another. In Japan, Construction Managers (CMRs) have been employed in projects to support project owners for about a quarter of a century. In recent years, CMRs have become established as a profession for building construction projects. However, initially, the existing professionals, such as architectural designers and engineers, changed their occupation to CMR and assumed the role.

Therefore, this paper aims to identify the transitions of expertise, the challenges of changing professional occupation and the process of adaptation after the occupational change from architectural designers/engineers (A/E) to CMRs in Japan. To achieve this goal, the outline and expertise of CMRs with that of *Kenchikushi* (建築士), the exclusive professional qualification for architectural design and engineering in Japan, is compared to present a framework for their transition of expertise. Next, semi-structured interviews about the experiences of occupational change from architectural designer/engineer to CMR is conducted. Consequently, this paper presents a model for the adaptation process of changing professional occupations as a TEM (Trajectory Equifinality Model) based on TEA (Trajectory Equifinality Approach).

Regarding professional career changes, previous researched consider changes in professional employment and work arrangements. Nishimura analyzed the actual situation of medical professionals and white-collar professionals in companies from the viewpoint of the skill formation process (job ladder) [2]. Ito analyzed the self-transformation process of students who entered nursing training institutions after working experience by TEM [3]. On the other hand, this study addresses the occupation change of the existing profession to the emerging profession that occurred in the same industry.

2. EXPERTISE OF CMR AND *KENCHIKUSHI*

2.1. Historical background

Until the *Edo* period (1603-1867) in Japan, the mainstream of building construction system was the design-build method by a master carpenter [4]. In the *Meiji* era (1868-1912), the concept of architects was imported from Western Europe and the United States, and architects were trained at the Department of Architectural Design at the Imperial College of Engineering (later Tokyo Imperial University) [5]. Subsequently, the Act on Architects and Building Engineers (*Kenchikushi Hou*) was enacted in May 1950, following a professional movement for the enactment of the Architect Law since the submission of a draft proposal for the enactment of the Architect Law by the *Nihon Kenchikushi kai* (now the Japan Institute of Architects) to the House of Representatives in March 1925 [6]. *Kenchikushi* is exclusively qualified for design and construction supervision (checking the construction work against the construction documents and confirming that the work has been carried out in accordance with the construction documents).

However, as owners' requirements diversified to include programing, cost management, and maintenance, owners' dissatisfaction with *Kenchikushi*'s service such as project budget planning, team organization and direction, and cost control capabilities increased [7]. As a result, design firms and management companies specializing in architectural management services, which were highly dissatisfied by owners, began to appear in the late 1990s [8]. In 2001 the Japan Construction Management Association (hereafter, CMAJ) was established and in the nest year, MLIT (the Ministry of Land, Infrastructure, Transport and Tourism) compiled guidelines for the use of Construction Management methods. CMAJ has developed a code of ethics, training opportunities, certification, and other elements as a professional association [9], and the number of building construction projects in which CMRs participate has increased. The prescribed work experience is required to apply for a license.

2.2. Legal status

According to the provisions of the Act on Architects and Building Engineers, design and construction supervision can only be performed by *Kenchikushi*. In addition, when designing and supervising construction work as a business, it must be registered as a registered *Kenchikushi* firm. To qualify as *Kenchikushi*, one must graduate from a university or other institution after completing courses related to architectural design and engineering designated by MLIT or meet the examination requirements by possessing the prescribed qualifications, etc., and then take and pass the *Kenchikushi* examination to receive a license from the MLIT. The details of *Kenchikushi*'s services are set forth in MLIT's Notification "Standards of Remuneration that the Establisher of a *Kenchikushi* Firm may Charge with respect to its Services," which currently applies Notification No. 8 (promulgated on January 9, 2024).

On the other hand, there are no legal qualifications for CMR. As a private qualification, for example, CMAJ has established a certification system for Certified Construction Managers (CCMJ) since 2005. However, it is possible to work in CMR positions without holding a certification. The scope of CMR's work is not the standard work of Notification No. 8 of MLIT and is not a "statutory obligation" that must be performed by *Kenchikushi* in accordance with the law.

2.3 Contractual relationships in building construction projects

The owner enters a design service contract with the designer and a construction supervision service contract with the construction supervisor. It is not necessary to use the same firm for design and construction supervision, but it is more often the case that they are the same. In general, *Kenchikushi*'s areas of expertise in design work are divided into architectural design, structural engineering, and MEP engineering, and some *Kenchikushi* firms only provide one of these services. In such cases, the owner may contract with several *Kenchikushi* firms, but more often the owner contracts with one *Kenchikushi* firm specializing in architectural design, and that firm subcontract part of the work. If the owner needs to outsource management services for a building construction project, they enter a management services contract. The main contracts in a building construction project includes a construction contract between the owner and the general contractor, but this is not the focus of this paper.

2.4 Works in building construction project

Building construction projects generally follow the following process: programming phase, schematic design phase, design development phase, construction procurement phase, and site construction phase.

The details of services at each stage are detailed in Furusaka [10], CMAJ [11] and so on. Based on MLIT's Notification No. 8 and CMAJ's "Construction Management (CM) Service Contract Terms and Conditions and Service Agreement (determined November 2007, revised July 2022)," Table 1 shows the works of *Kenchikushi* and CMR at each stage.

2.5 Contrasts of expertise

Based on the studies conducted up to the previous section, the expertise of *Kenchikushi* and CMR is contrasted and shown in Table 2. Both professionals have buildings as the subjects of their projects and share the common building project process. On the other hand, CMRs participate in projects solely under contract with the owner, whereas *Kenchikushi* perform design, construction supervision exclusively as *Kenchikushi* and participate in projects in accordance with legal requirements. In addition, *Kenchikushi* have clear deliverables (e.g., design documents), while CMR do not. CMR perform more people-oriented tasks, such as support and reporting required by the owner and coordination among the parties involved, and they also place more emphasis on managing schedules and costs. Furthermore, the selection of the architect/engineer prior to the design phase and the support and confirmation of the design during the design phase, as well as the confirmation related to construction supervision services and construction supervisors during the site construction phase, are tasks that are performed only by CMR.

2.6 Transition of Expertise

In the change from architectural designer/engineer to architectural management, it is expected that the position and scope of work on a building construction project change, and consequently, the need to adjust the criteria for judgment and methods for promoting the work that have been developed up to that point. Specifically, the following transitions of expertise are thought to be occurring.

(1) New acquisition of expertise: support of the owner, especially in the coordination and management of the overall project (project parties, schedule, and costs), selection of architectural designers/engineers (designers and construction supervisors) and confirmation of their work.
(2) Use of existing expertise: Knowledge and experience in building project processes, buildings, and construction techniques (but not all expertise will be used).
(3) Adjustment of existing expertise: Adjustment to adapt to changes in scope, authority, and responsibility caused by changes in legal status, contractual relationships, service content, etc.

Table 1. Works of *Kenchikushi* and CMR at each stage

Phases	Purpose of each phase	*Kenchikushi*	CMR
Programming	- Review of the project owner's objectives for the project, facility outline, and project delivery method - Clarification of requirements (facility size and function, completion date, budget, etc.) - Investigation of constraints (site, environment, laws and regulations, etc.) - Preparation of program and basic plans	*This phase of task is not the exclusive responsibility of *Kenchikushi* but is performed by the owner or an outside consultant of their choice.	(As common tasks) - Formulation of basic policy for project delivery method - Selection of designers, design-builders, construction supervisors, etc. (tasks at procurement planning stage, preparation of materials for selection, evaluation in selection)
Schematic design	- Various studies based on the program and basic plan, and sequential determination of design details - Preparation of schematic design documents (Building outlines are compiled based on the owner's requirements and other design conditions)	- Arrangement of design conditions, etc. - Investigation of laws and regulations - Meetings with related agencies - Survey of infrastructure supply status - Establishment of schematic design policy - Preparation of schematic design documents	- Confirmation of schematic design policy document - Confirmation of design schedule - Advice and support for preliminary deliberations - Confirmation of design progress - Monitoring of schematic design contents - Preparation of proposed construction schedule

		- Consideration of rough estimation of construction cost - Explanation of schematic design	- Confirmation of rough estimation of construction cost - Confirmation of schematic design documents
Design development	- Preparation of design development documents (Finalize design details to the extent that the construction contractor can estimate construction costs)	- Confirmation of owner's requirements, etc. - Discuss changes in design conditions after schematic design - Examine the contents of the schematic design in more detail. - Preparation of design development documents - Meetings with related agencies for building permit application - Preparation of building permit application documents - Consideration of rough estimation of construction cost	- Confirmation of design development policy - Confirmation of design schedule - Support for applications related to permits and approvals - Confirmation of design progress - Monitoring of design development contents - Update of proposed construction schedule - Confirmation of rough estimation of construction cost - Confirmation of design development documents
Construction procurement	- Estimation of construction cost based on design development documents - Selection of construction contractor and conclusion of construction contract	- Construction cost study and estimation, etc. - Support for construction and procurement *Items above are additional work as per Notification No. 8.	- Tasks at procurement planning stage of contractor - Confirmation of construction procurement division - Determination of contractor delivery method - Preparation of contractor delivery documents - Support for contractor delivery - Evaluation in selection - Advice on construction contracts
Construction Execution	- Construction contractor prepares shop drawings for construction based on the contents of the construction documents - Drawing up construction plans and supervising specialized contractors to execute the construction work	- Question and answer sessions, explanations, etc. that accurately convey the design intent - Review and advice on selection of construction materials, equipment, etc. from the viewpoint of design intent - Grasping the contents of the construction documents - Review and report on shop drawings, etc. in comparison of the construction documents - Checking and confirmation of the construction work against the construction documents - Review and report on the contract cost specifications, schedules and construction plans stipulated in the construction documents. - Checking, confirming, and reporting on the construction work and the construction contract	- Confirmation of timing of response by the construction supervisor to construction plans, etc. - Confirming the timing of the response of the contractor and construction supervisor to the shop drawings - Coordination and advice among all parties involved in the construction - Response to design changes - Confirmation of workmanship and payment status - Confirmation of construction supervision report - Support for inspections by the owner

Table 2. Expertise of *Kenchikushi* and CMR

	Kenchikushi	CMR
Positioning	Exclusive of design, construction supervision, and other services as *Kenchikushi*. The owner must commission *Kenchikushi.*	Work outside of the *Kenchikushi*'s professional monopoly. Entrusted by the project owner on a voluntary basis.
Knowledge	Building and construction process, standards of building, drawings and specifications	In addition to the left, overall coordination and management of the project, selection of architects/engineers and confirmation of work
Skill	Design and making drawings and specifications, negotiation with related agencies, etc.	Owner support, management (planning, coordination, and control) of building project stakeholders, schedule and costs
Process	(Programming) → Schematic design/ design development → Construction procurement → Construction execution	Sharing the building project process with *Kenchikushi*
Work Objectives	Objects (what to build)	People (support and reporting required by the owner, coordination among relevant parties), schedule and cost
Deliverables	Design and construction documents, construction supervision report	No clear deliverables

3. METHODOLOGY

3.1 TEM

In this study, TEM (Trajectory Equifinality Model) is employed as the modeling method for the adaptation process in the case study. TEM is a core element of TEA (Trajectory Equifinality Approach), "a new approach in cultural psychology that seeks to make life understandable without discarding time" [12]. In TEM, draw a single horizontal arrow to represent irreversible time. Then, the process from one BFP (Bifurcation Point) toward one EFP (Equifinality Point) is depicted by multiple trajectories. At the BFP, there is a tension between two forces: SD (Social Direction), which is the force that keeps them away from the EFP, and SG (Social Guidance), which is the force that directs them toward the EFP [13]. TEM enables to understand the process of adaptation to a new professional occupation, as well as the supports and challenges of adaptation.

3.2 Case collection

Interviewees were collected by snowball sampling, using a method of asking for referrals of people who had experience changing occupations from architectural designer/engineer to CMR. The interviews were conducted from July 2021 to March 2022 and lasted approximately 30 minutes to 2 hours each. Interviewees were informed of the purpose of the study, the use of the data, and confidentiality, and their consent was obtained. Interviews were conducted by semi-structured interviews. The three questions asked were (1) an overview of their work history to date, (2) how they became adapted to their new occupation, and (3) how their expertise changed with their new occupation. A summary of the 11 cases collected is presented in Table 3. In order to capture the typical process of adaptation in changing occupations from architectural designer/engineer to CMR, this research analyzes and models five cases (Cases 3, 4, 6, 10, and 11), excluding cases in which the interviewees had other occupational experiences or schooling between architectural designer/engineer and CMR (Cases 1, 2, and 5) and cases in which they perceive as they have not adapted (Cases 7, 8, and 9). Note that TEA has a "1/4/9 rule," which states that when dealing with three to five cases, "it is possible to capture commonality and diversity"[14].

Table 3. Summary of 11 cases

	Interview date	Original occupation	Age at change of occupation	Organizational Transfers	Wish to change occupation
Case 1	7/21/2021	Architectural design/ Development	Early 30s	Yes	Yes
Case 2	7/27/2021	Architectural design	Late 30s	Yes	Yes
Case 3	7/28/2021	Architectural design	Late 30s	Yes	Yes
Case 4	7/30/2021	Site management/ Architectural design	Late 20s	Yes	Yes
Case 5	8/3/2021	Construction supervision/ Estimation	Early 30s	No	Yes
Case 6	8/3/2021	Architectural design	Early 30s	Yes	Yes
Case 7	8/5/2021	Architectural design	Early 30s	No	Yes
Case 8	8/17/2021	Architectural design	Late 20s	Yes	Yes
Case 9	3/2/2022	Estimation	Early 50s	No	No
Case 10	3/3/2022	Architectural design	Early 50s	No	No
Case 11	3/3/2022	MEP engineering	Early 30s	No	No

3.3 Coding

Qualitative coding (Open Coding), in which codes (labels) indicating textual content were assigned from the verbatim interview transcripts, was conducted for the five cases under consideration. Each qualitative code was assigned a number. These numbers were assigned according to the order of the verbatim transcripts for each case. For example, the fourth qualitative code in Case 3 is "C3-4". A total of 300 qualitative codes were obtained: 63 from Case 3, 50 from Case 4, 79 from Case 6, 57 from Case 10, and 51 from Case 11. Note that qualitative codes related to statements that had little direct relationship to the interviewee's occupational change (e.g., their colleagues' occupational change or current situation of the company) were excluded. Next, focused coding was conducted for each case, where codes were grouped together based on the semantic coherence of the qualitative codes and given more abstract and conceptual codes. The resulting 31 focused codes are shown in Table 4.

4. DISCUSSION

4.1 Transition of expertise

Of the focus codes shown in Table 4, eight codes for the transition of expertise are (24) through (31): (24) can use the former expertise as it is, (25) can use the former expertise for adaptation, (26) can develop the former expertise to a new expertise, (27) can use the former expertise in some cases, (28) recover the original expertise, (29) retain the former expertise, (30) cannot use the former expertise, (31) acquire a new expertise. These are shown in Figure 1.

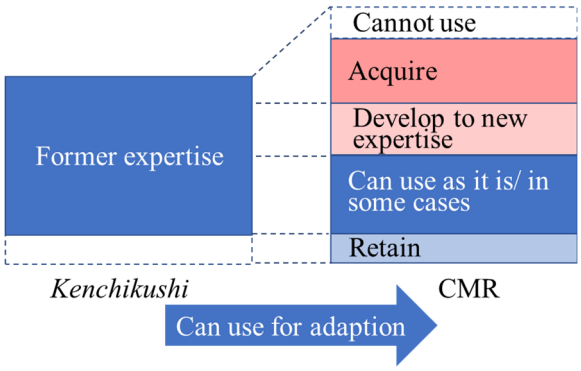

Figure 1. Transition of expertise in case studies

Table 4. Results of focused coding

Focused code		Case 3	Case 4	Case 6	Case 10	Case 11
1	Former experience	Y	Y	Y	Y	Y
2	Considering a career change		Y			
3	Considering an occupational change	Y		Y		
4	Directed to an occupational change				Y	Y
5	The CMR arises as an option	Y	Y	Y	Y	Y
6	Temporary change of occupation is planned.		Y			
7	Positive recognition of occupational change				Y	
8	Negative recognition of occupational change					Y
9	Serving as CMR	Y		Y	Y	Y
10	Differences from A/E (Architectural designers/Engineers)	Y	Y	Y	Y	Y
11	Positive recognition of A/E	Y		Y	Y	
12	Negative recognition of A/E	Y	Y	Y		
13	Negative recognition of CMR	Y			Y	
14	Positive recognition of CMR	Y	Y			Y
15	Work practices	Y				Y
16	Emergence of hurdles	Y	Y	Y	Y	Y
17	Study					Y
18	Supervisor involvement		Y			Y
19	Help with adaptation	Y	Y	Y	Y	Y
20	Hurdle resolution	Y	Y	Y		Y
21	Non-adopted perception	Y				
22	Smooth adaptation			Y	Y	
23	Adapted perception	Y	Y	Y	Y	Y
24	Can use the former expertise as it is	Y	Y	Y	Y	Y
25	Can use the former expertise for adaptation	Y	Y	Y	Y	Y
26	Can develop the former expertise to a new expertise	Y	Y	Y	Y	Y
27	Can use the former expertise in some cases	Y				
28	Recover the former expertise			Y		
29	Retain the former expertise					Y
30	Cannot use the former expertise	Y	Y			Y
31	Acquire a new expertise	Y	Y	Y	Y	Y

Common to all cases are (24), (25), (26), and (31). (24) "can use the former expertise as it is" refers to the former expertise and skills, such as programming (Case 10, C10-11) and checking design drawings (Case 3, C3-46), and interpersonal skills, such as sensing the client's thoughts (Case 6, C6-19). In (25) "can use the former expertise for adaptation," the former expertise facilitates adaptation to CMR, such as management experience as an architectural designer (Case 4, C4-29), which is a different position from that of the CMR, or knowledge and understanding of the CMR from a different standpoint gained by participating as a designer in a project involving the CMR (Case 10, C10-22). On the other hand, in (26) "can develop the former expertise to a new expertise," the former expertise develops into CMR expertise, such as being able to use knowledge of legal regulations in CMR work (Case 4, C4-27) and having a firsthand understanding of the timing of decision making in construction projects (Case 11, C11-30). (31) "acquire a new expertise" includes expertise in cost management (Cases 4, C4-31 and 11, C11-34) and understanding the big picture of management from the project owner's perspective (Case 10, C10-49).

Of course, not all former expertise is useful, and there is a perception that (27) "can use the former expertise in some cases" and (30) "cannot use the former expertise" because "doing something different

from the design (Case 3, C3-33).” On the other hand, in Case 6, there was to (28) “recover the original expertise.” This was that after becoming a CMR, he regained his intuition regarding large-scale construction, which he had not used for some time in his design work (C6-37). Furthermore, in Case 11, there was an attempt to (29) “retain the former expertise” by continuing to take opportunities to improve knowledge and skills related to MEP design and construction execution after changing professional occupation to CMR. Note that “adjustment of existing expertise” presented in 2.6 was not obtained as a code for the transition of expertise but was collected as a code for (16) “emergence of hurdles,” which is discussed in the next section.

4.2 Adaptation process

The focus codes shown in Table 4 are used to examine the adaptation process after the change of occupation and to create a TEM (Figure 2). The 23 codes from (1) to (23), excluding the codes related to the transition of expertise, can be divided into four groups. First, (1) “former experience”. This is the occupational experience prior to the occupational change. Second are the focus codes (2) through (9), which relate to occupational changes. The third is the focus code for adaptation to a new occupation, from (10) to (20). The fourth is self-perception regarding adaptation, from (21) to (23).

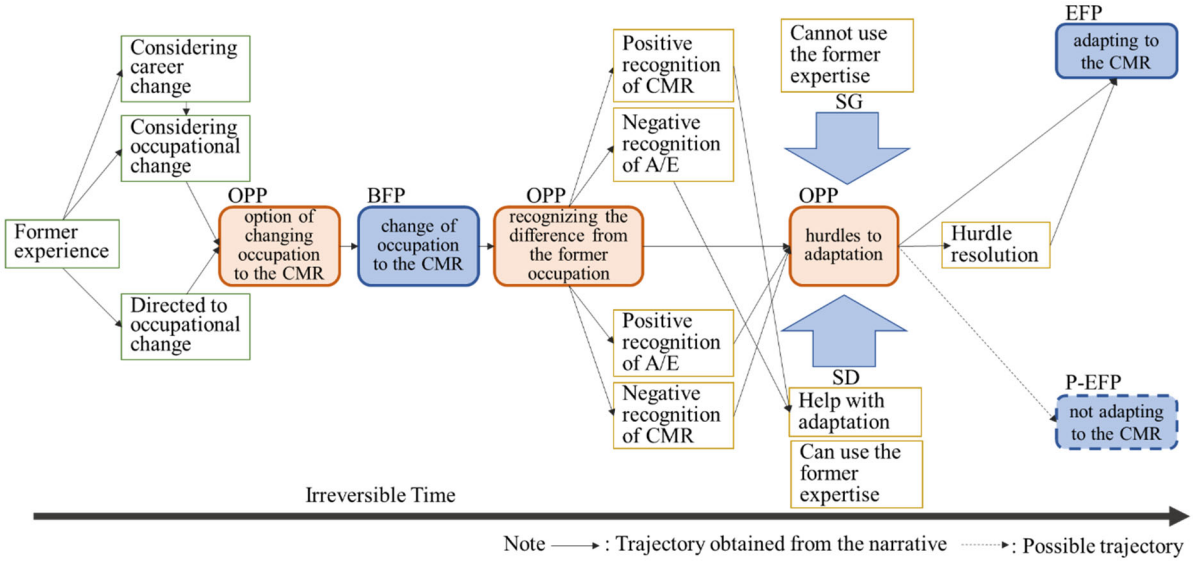

Figure 2. TEM for adaptation process

In all the five cases examined in this paper, the final result is a self-perception of having adapted to the new occupation (CMR) after the occupation change. Therefore, the EFP (Equifinality Point) can be set as “adapting to the CMR” according to (23). Polarized Equifinality Point (P-EFP) is “not adapting to the CMR”. In each case, the BFP (Bifurcation Point) is “change of occupation to the CMR” according to (9) since the occupation is actually changed from the previous one to CMR. BFP is “focused as an action or option to be realized in a non-reversible flow of time that can never be reversed” [15]. The “option of changing occupation to the CMR” is designated as the Obligatory Passage Point (OPP), because before the change of occupation is made, “the CMR arises as an option” in (5) both in the own consideration (3) and in the company’s direction (4). Furthermore, in all cases, both process of “recognizing the difference from the former occupation, A/E (architectural designers/engineers)” (10) and “hurdles to adaptation” (16) are also experienced, thus these are designated as OPPs. Codes for the transition of expertise are depicted as SD (Social Direction) leading to adaptation or SG (Social Guidance) hindering adaptation.

The adaptation process is examined in more detail. There are two types of triggers that lead to CMR as an option: one is due to their own consideration (3) and the other is due to directions from the company (4). Of the cases 3, 4, and 6, which are due to their own consideration, cases 3 and 6 consider an professional occupation change from the beginning because of completion of design career (C3-1) and considering the next step up (C3-6, C6-7). On the other hand, in Case 4, he started to seek another job due to the economic environment (C4-5) but felt that he lacked knowledge and skills related to cost

as a designer (C4-7, C4-33), and as a result, thought that become to a CMR would be a good idea (C4-8). In this case, he considered the occupation change to CMR to be temporary (6). In addition, Case 10 and Case 11, where the occupation change was directed by the company, show contrasting perceptions of the directions. In Case 10, the change direction was recognized as "just good time" (C10-52), whereas in Case 11, the change to CMR was recognized as "a bolt from the blue" (C11-5).

The way of the perceptions regarding the differences between the previous occupations, A/E and CMR, varied from case to case. In Case 3, the positive and negative recognition of both the A/E and CMR were mentioned, while in Case 4, only the negative recognition of the A/E and positive recognition of CMR were mentioned, and conversely, in Case 10, only the positive recognition of the A/E and the negative recognition of CMR were mentioned. Nevertheless, in all cases, there was a recognition of the difference in the position and tasks in the organizational structure of the building project, such as "should not to act like the designer" (C3-49) and "not the designer" (C10-17).

In Case 3 and 10, recognitions about the positive aspects of the A/E and the negative aspects of the CMR led to hurdles in adaptation. For example, in Case 3, "understanding the deliverables of the work as a CMR" (C3-15) leads to an adapted perception. The premise for this is the recognition that *Kenchikushi* have concrete deliverables such as design documents, which "give a sense that the designer is doing the work" (C3-14), whereas "CMR needs evidence that they have done the work" (C3-13). The recognition of the difference between the two also became a hurdle to adaptation: "I don't know what to say if I am not the designer" (C3-53), and "I understand the designer's feelings too much" (C4-48). Naturally, the change in the actual work performed due to the change in occupation is another hurdle to overcome. In Case 11, work began with "not knowing what to do as the job" (C11-40) and the "stress of dealing primarily with money" (C11-27).

In addition to (17) study by classroom lecture, related to these hurdles, there were seen overcoming process through work of "taking time for trial and error" (C6-75) and "exactly on-the-job trainings (C3-28). There, (18) supervisor involvement and (19) help with adaptation are also useful. In Cases 4 and 11, they said that their supervisors "let me do my work independently" (C11-25), while "I can ask for help and rely on them when I have a problem" (C4-21). In addition, colleagues who "teach me if I ask" (C10-43), reference materials such as "references to deliverables" (C3-30) and "reviewing past materials" (C6-27), and their own attitude also helped their adaptation. In Case 11, the attitude of "trying to absorb things outside of the conventional framework" led to the joy of "increasing the range of things I can be involved in and the things I can understand." It should be noted that even when the perception of adaptation is achieved, as in Case 10, the hurdle has not necessarily been resolved.

5. CONCLUSION

This study examined the transitions of expertise, the challenges of changing professional occupation and the process of adaptation after the occupational change from architectural designers/engineers (A/E) to CMRs (Construction Managers) in Japan. To this goal, a framework of expertise for CMR and *Kenchikushi* was obtained through a literature study. Then, case studies were conducted and the collected five cases were coded to examine the transition of expertise. Furthermore, the adaptation process after the change of professional occupation was modeled using the TEM (Trajectory Equifinality Model). The results obtained were as follows.

- The transition of expertise can be seen as: can use the former expertise as it is, can use the former expertise for adaptation, can develop the former expertise to a new expertise, can use the former expertise in some cases, recover the original expertise, retain the former expertise, cannot use the former expertise, acquire a new expertise.

- In addition to the occupation change itself, positive perceptions of the former occupation, negative perceptions of the new occupation, and perceptions of the difference between the two occupations can also be hurdles to adaption.

- The adaptation process after professional occupation change is depicted by TEM as EFP for adapting to the CMR, BFP for change of occupation to the CMR, and option of changing occupation to the CMR, recognizing the difference from the former occupation, and hurdles to adaptation as OPP.

A future task is to consider the TEM diagram for all cases collected, including those with a period between occupational changes and those who were unable to adapt to the new occupation. In addition, further study is needed not only on the challenges of adaptation, but also on the help of adaptation.

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