Study on a Practical Use of Task Analysis in Vocational Rehabilitation

[Survey Report No. 82] Summary

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Composition of the Survey Report

Overview
Chapter 1: Background, purpose and method of the study
Chapter 2: "Task Architect"
Chapter 3: How task analysis is used and how to use Task Architect
Chapter 4: How Task Architect is tried
Chapter 5: Summary

Documents

Purpose and method of the survey

■ Background and purpose of the study
In the vocational rehabilitation of persons with disabilities, it is considered to be important to accommodate working conditions (working environment) that support such persons as well as direct support for individuals with disabilities such as vocational consultation, vocational evaluation, pre-vocational training, Job Coaching etc. Regional and local vocational centers for persons with disabilities and other vocational rehabilitation agencies, task analysis is utilized as a technique for providing effective support for the working conditions (working environment). In "Job Coaching" and "Support for the Return to Work of Persons with Mental Disabilities", practical techniques are needed to provide specific suggestions to employers in terms of adjustment of work and human environments to meet disability traits, job creation, and job re-design based on a result of the task analysis.
This study is therefore intended to elucidate the prospects for the availability of "Task Architect — a software package for helping Hierarchical Task Analysis (HTA) — as an effective method of task analysis in the situations of vocational rehabilitation, and the prospects for cutting the costs for task analysis.

■ Method of research
In addition to questionnaire surveys concerning the cases collected to grasp the use of task analysis and the work process analysis for vocational rehabilitation counselors at regional/local vocational rehabilitation centers for the disabled, the coauthors organized and analyzed the results of hearing surveys on the trial status of "Task Architect" with regard to local vocational rehabilitation centers for the disabled of the study cooperation.

Research period
Fiscal 2006 to 2007
Contents of the survey

■ "Task Architect"

1. Overview of Task Architect
"Task Architect" is a commercially available software application developed by Task Architect Company in Canada for supporting task analysis, which this software is used in various industries overseas.

2. Functions of Task Architect
When conducting HTA, it is necessary to indicate the hierarchy of work processes by tables and charts. This work can be done using another commercially available spreadsheet or graphic software, but using Task Architect, it is easy to arrange the work processes usually, entering information about work processes collected in an established format (spreadsheet) creates a list view of those work processes (Fig. 1) or a tree diagram representing the hierarchical structure (Fig. 2), both of which can be freely edited.

![Fig. 1 Example of a list view](image)
Fig. 2  Example of a tree diagram (an overview tree)

Also the use of a "template" (Table 1), which can be used differently according to the viewpoint of analysis and a "property" (Fig. 3), that is useful in considering specific methods of addressing your challenges, thereby enabling efficient task analysis in the situations of vocational rehabilitation.

<table>
<thead>
<tr>
<th>Template name</th>
<th>Possible analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>basic_JP</td>
<td>Basic task analysis</td>
</tr>
<tr>
<td>CBT_JP</td>
<td>Analysis of ability training</td>
</tr>
<tr>
<td>Cognitive Work Analysis_JP</td>
<td>Analysis of cognitive work</td>
</tr>
<tr>
<td>Human error assessment template_JP</td>
<td>Analysis of human errors</td>
</tr>
<tr>
<td>risk_JP</td>
<td>Risk analysis</td>
</tr>
<tr>
<td>Timelines template_JP</td>
<td>Schedule analysis</td>
</tr>
<tr>
<td>Training needs analysis_JP</td>
<td>Analysis of training needs</td>
</tr>
</tbody>
</table>
Uses of task analysis and method for utilization of Task Architect

1. Survey of the uses of task analysis

To monitor the uses of task analysis in the situations of vocational rehabilitation, the coauthor conducted a questionnaire survey of vocational counselors for persons with disabilities at regional/local vocational centers for persons with disabilities. Survey findings indicate that, although methods of task analysis are not sufficiently used at all regional/local vocational centers for persons with disabilities, some local vocational centers that positively employ task analysis have demonstrated its effectiveness.

2. Proposition for a method of task analysis based on Task Architect

The information about work processes at the host business place collected during usual work by vocational counselors for persons with disabilities was actually entered into Task Architect by the researchers in charge. They then proposed cases as pertaining to methods of use (31 cases).

Here, the coauthors organized the relation between the viewpoint of task analysis in vocational rehabilitation and the templates in Task Architect. The coauthors then organized data centering on the cases of proposals using "Timelines template_JP" (considered effective in supporting efforts to make work routines habitual) and "Human error assessment template_JP" (considered useful in reviewing and implementing measures for supporting people likely to make mistakes in operation).

Regarding the use of "Human error assessment template_JP", note that the coauthors modified the software so as to match the property definition with vocational rehabilitation according to technical documents on ergonomics that detail all of its types, causes, and actions against human errors.

The following figures show cases of using "Timelines template_JP" (Fig. 4) and "Human error assessment template_JP" (Figs. 5 and 6).
<table>
<thead>
<tr>
<th>時間</th>
<th>本人</th>
<th>他者</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5.  お湯の準備、霜折り</td>
<td>1. 加工前の豚足の選別</td>
</tr>
<tr>
<td>20</td>
<td>4. 回転釜Ⅰのスイッチと熱湯を入れて、変換する (15分)</td>
<td>2. 回転釜Ⅰに加工前豚足の差入れ</td>
</tr>
<tr>
<td>40</td>
<td>5. 回転釜Ⅰ内の豚の抜け具合を見て、お湯を替え...</td>
<td>6. 別途作業</td>
</tr>
<tr>
<td>60</td>
<td>7. 逐次、回転釜Ⅱに加工前豚足の差入れ</td>
<td>7. 逐次、回転釜Ⅱに加工前豚足の差入れ</td>
</tr>
<tr>
<td>80</td>
<td>8. 逐次、回転釜Ⅱのスイッチと熱湯を入れて、差入れ (15分)</td>
<td>11. コンテナの水洗い、準備</td>
</tr>
<tr>
<td>100</td>
<td>9. 回転釜Ⅱ内の豚の抜け具合を見て、お湯を替え...</td>
<td>13. 豚足が長かった豚足をバーナー台へ差べる</td>
</tr>
<tr>
<td>120</td>
<td>10. 逐次、豚足を、コンテナに取り出す</td>
<td>14. 逐次と結合しなかった豚を、バーナーで反転させる</td>
</tr>
<tr>
<td>140</td>
<td>12. 回転釜Ⅰ、Ⅱのスイッチと熱湯を入れて、くず子を水洗いする</td>
<td>15. 毛焼き処理後の豚足を回転釜Ⅰに投入する</td>
</tr>
<tr>
<td>160</td>
<td>16. お湯の準備</td>
<td>19. 別途作業</td>
</tr>
<tr>
<td>180</td>
<td>17. 回転釜Ⅰのスイッチと熱湯を入れて、差入れ</td>
<td>20. 毛焼き処理後の豚足を回転釜Ⅱに投入する</td>
</tr>
<tr>
<td>200</td>
<td>18. 回転釜Ⅰ内の豚の抜け具合を見て、お湯を替え...</td>
<td>21. 別途作業</td>
</tr>
<tr>
<td>220</td>
<td>21. 回転釜Ⅱのスイッチと熱湯を入れて、差入れ</td>
<td>22. 回転釜Ⅱ内の豚の抜け具合を見て、お湯を替え...</td>
</tr>
<tr>
<td>240</td>
<td>23. 毛焼き処理後の豚足を、コンテナに取り出す。</td>
<td>23. 毛焼き処理後の豚足を、コンテナに取り出す。</td>
</tr>
<tr>
<td>260</td>
<td>24. 回転釜Ⅰ、Ⅱの水洗い</td>
<td>24. 回転釜Ⅰ、Ⅱの水洗い</td>
</tr>
<tr>
<td>280</td>
<td>26. 豚足をA級品とB級品に選別する</td>
<td>26. 豚足をA級品とB級品に選別する</td>
</tr>
<tr>
<td></td>
<td>27. 選別した豚足を、それぞれ箱詰めるする</td>
<td>29. 片付け、または2度目の加工前豚足の選別</td>
</tr>
<tr>
<td></td>
<td>28. 霜折り</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 4  Example of "Timelines template JP"
(1) Enter an ordinary work process.

(2) Select and display a property definition.

(3) Change it to the work process for client.

(4) Select a specific action according to disability characteristics of the client.

Fig. 5 List view where a property definition is selected

Fig. 6 List view indicating work processes and specific actions for client
Trial status of Task Architect

The coauthors conducted hearings on the trial use status of Task Architect with local vocational centers for persons with disabilities, and then considered the possible use of Task Architect and prospects for cost-cutting involved in task analysis.

These findings revealed that the main situations of use at local vocational rehabilitation centers were "use in vocational consultation", "use in guidance for work adjustment ", and "use in job coach assistance". Their respective contents are summarized below. Fig. 7 shows a typical list view created in Task Architect; Figs. 8 and 9 show tree diagrams.
Concerning the prospects of cost-cutting for task analysis, some people commented that this software application requires less time than other applications if only used to create lists of work processes and tree diagrams showing hierarchical structure, but when property redefinition is involved, it does not necessarily save time. Another person noted that the opportunities to use Task Architect may be lost due to insufficient time between the formulation of a vocational rehabilitation plan regarding job coach assistance and the beginning of provision of actual assistance.

1. Use in vocational consultation
   1) Task Architect was used as a material for consultation to clarify the image of appropriate job content for clients who find it difficult to make realistic job selections.
   2) Task Architect was used to make it possible to realistically consider the direction of job-seeking activities for clients who find it difficult to understand and organize the procedure for such activities (e.g., disclosure and nondisclosure of disabilities, respective advantages and disadvantages thereof).

2. Use in guidance for work adjustment
   1) To rehabilitate clients showing unstable workplace attendance, the clients were made to carry a tree diagram showing the action and communication procedures whenever they hesitated to go to work, thereby helping them to achieve stable attendance.
   2) Task Architect was used to prepare a schedule and create a work process table (as a complementary means) for clients who may be unable to fulfill their daily duties due to a failure to remember a given work procedure, as well as less spontaneity.

3. Use in job coach assistance
   1) Task Architect was used to consider the content of preliminary assistance and methods of assistance being employed, because this assistance project was designed for inexperienced tasks by vocational counselors serving persons with disabilities.
   2) Task Architect was used as an explanatory material for making proposals to business owners for creating jobs for the clients.
Future challenges and issues
Among the advantages of using Task Architect in the situations of vocational rehabilitation are:
1) It makes it easier to recall the lower-level hierarchy of each work process, and is consequently useful in getting an overall image of all work processes.
2) Costs for task analysis can be reduced by limiting efforts to using lists of work processes and tree diagrams.
3) Using properties and task-emphasis functions can provide clues to organize the information in an integrated fashion and to consider measures of specific assistance for clients.

Conversely, other challenges and considerations include the following:
1) It must be customized according to purpose in order to make the templates for task analysis usable in the situation of vocational rehabilitation.
2) Since printing functions are limited after editing, some editing must be done using other application software.
3) It is desirable to provide automatic display of a legend linked with task-emphasis and add templates designed specifically for time scheduling.

In this way, it has been found that, although the functions of Task Architect that can be used immediately as installed are partially limited, they may be also used somewhat as a tool for more efficiently conducting task analysis at vocational rehabilitation agencies.

In this study, however, the trial cases of HTA based on Task Architect were limited to only a few, so that the coauthors were unable to conduct an adequate study on availability from a broader perspective.

In the future, it will be necessary to further organize the use cases of HTA and consider the uses of various functions of Task Architect in the situations of vocational rehabilitation. The coauthors also hope that these efforts will trigger the further use of Task Architect, and that the method of task analysis will provide an opportunity for vocational rehabilitation agencies to use it actively.

Main references
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