Better Organization of Legal Knowledge

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The increasing need of legislatures to draft complicated statutes, e.g., the Internal Revenue Code, requires the development of new techniques for defining and communicating complicated policies both accurately and understandably. At present, these complicated statutes are expressed in long, convoluted sentences with frequent uses of exceptions and limitations. Current drafting technique, with its inadequacies, often hinders a comprehensive understanding of the policy being communicated and often fails to communicate the policy accurately. Moreover, with the voluminous increase of legal literature in recent times, legal researchers experience increasing difficulty in attempting to retrieve relevant judicial and administrative interpretations.

The authors propose a technique for improving the legal communication network by clarifying its messages, making them amenable to more organized storage, and thereby simplifying their retrieval. We anticipate that this technique will encourage more accurate and understandable legal drafting and will facilitate the analysis of legal problems and the retrieval of relevant legal information.
I. NORMALIZATION

A. The General Features.

When a statute is converted into normalized form, parts of the original text are expressed as sentences related by "and," "or," "if-then," "it is not so that," and "if and only if-then" in such a way that the resulting normalized version expresses the same set of ideas as the original text. For example, suppose the original text of a provision reads as follows:

Example 1

(1) If the court shall deem it necessary or the defendant shall so demand, the jury of twelve freeholders shall be summoned and whenever a jury is required such jury shall determine the sanity or insanity of the defendant.

The same set of ideas expressed in this original text can be written in the following normalized form:

In this version, "If," "or," "and" and "whenever" (the syntax words of the original text) are replaced by "If-then," "or" and "if-then" (the syntax words of the normalized version) and each sentence is itemized. Thus the syntactic relationships among phrases in the original text are expressed visibly and unambiguously in the normalized version (1n) and in its accompanying diagram (1d).

Before describing the procedure for transforming the original text into a normalized version, comment upon two key terms is required: (1) a constituent sentence of the
normalized version and (2) the diagram of the normalized version.

Suppose the structure of the normalized version of Example 1 and the structure of its accompanying diagram are as follows:

```
(1d)    (1n)
     /   \
    /     \
   A     1. If
     \   /  a/ 1) A, or
    /   \    2) B
   B     then
     \   b/ C, and
    /     2. if
   C   a/ D
     \ then
    /   b/ E
   D     
     /   \n    /     C
   E
```

where A, B, C, D, and E represent sentences, such as "the court shall deem it necessary," "the defendant shall so demand," etc. Each of A, B, C, D, and E represents a constituent sentence of the normalized version. Thus, "the court shall deem it necessary" is a constituent sentence of the normalized version, and "the defendant shall so demand" is also a constituent sentence of the normalized version, etc.

A constituent sentence of the normalized version is also used in another, broader sense. In addition to A, B, C, D, and E, the following also represent constituent sentences of the normalized version: "If A or B then C," "If D then E," and "(If A or B then C) and (if E then F)." Thus, "the court shall deem it necessary or the defendant shall so demand" and "If the court shall deem it necessary or the defendant shall so demand, then the jury of twelve freeholders shall be summoned" are both constituent sentences of the normalized version in this broader sense.

The diagram to the left of the normalized version is the diagram of the normalized version, which provides a graphic illustration of the syntactic relationships among the constituent sentences of the normalized version.

B. Procedure for Normalizing Original Text.

The procedure for transforming the original text into the normalized version is divided into several steps.
1) Dividing the Original Text Into Syntax Words, Original Text Sentences, Sentence Parts, and Non-Sentence Parts.

The first step in normalizing is to classify the original text into original text sentences, their sentence and non-sentence parts, and syntax words. When one divides the original text into its several components, the first guideline is the period of a sentence. We shall call the series of words and punctuation in the original text that ends with a sentence-ending period an original text sentence.

\[
\text{(1)} \quad \text{If [the court shall deem it necessary] or [the defendant shall so demand,] [the jury of twelve freeholders shall be summoned] and whenever [a jury is required] [such jury shall determine the sanity or insanity of the defendant.].}
\]

This example represents one sentence from the original text (original text sentence) which has been divided into its constituent parts. The entire original text sentence is labeled 1, and the constituent parts of this sentence have been bracketed and labeled A, B, C, D, and E. It should be noted that in this particular example the constituent parts of the original sentence are all themselves sentences. Constituent parts of the original text sentence which are themselves sentences are called sentence parts.

Now suppose that the original text sentence reads as follows:

\[
\text{Example 2}
\]

\[
\text{(2) [The father or mother of the alleged insane person] [may petition for an order of admission of said person to a hospital.].}
\]

The label 2 is applied to the entire original text sentence, “The . . . hospital,” and A1 and A2 designate what has been defined above as the constituent parts of the original text sentence. In this case, however, A1 and A2 are not themselves sentences. Constituent parts of the original text sentence which are not in themselves sentences are called non-sentence parts. For some purposes, it will be useful to transform these bracketed non-sentence parts into sentences that will become constituent sentences of the normalized version. (The criteria governing such a transformation will be discussed in Section...}
Thus, the non-sentence parts, "The father or mother of the alleged insane person" and "may petition for an order of admission of said person to a hospital" are transformed into sentences in the following normalized version:

\[
\begin{array}{c}
(2d) \\
A \\
B \\
\end{array}
\quad \begin{array}{c}
(2t) \\
\text{If} \end{array}
\begin{array}{c}
\text{a person is the father or mother of} \\
\text{the alleged insane person} \\
\text{then} \\
\text{he may petition for an order of admission of said person to a hospital.}
\end{array}
\]

The parallels between the original text and the normalized version are sketched below.

**An Original text sentence** consists of
1. syntax words
   and
2. constituent parts which are either
   a. sentence parts
   or
   b. non-sentence parts.

**A Normalized version** consists of
1. syntax words
   and
2. constituent sentences.

In summary, the first step in normalizing is to underline the syntax words of the original text, to determine the original text sentences, to bracket the constituent parts of the original text sentence (sentence and non-sentence parts), and to enter their sentence labels at the righthand margin of the original text. The results of this procedure are shown for both Example 1 and Example 2. One difference between the notations should be pointed out. In Example 1, the constituent parts of the original text sentence are labeled A, B, C, etc., which means that sentence 1 of the original text contains the sentence-parts 1A, 1B, 1C, etc. The constituent parts in Example 2, however, are not labeled A, B, but rather A1, A2. These labels indicate that sentence 2 of the original text is composed of the two non-sentence parts 2A1 and 2A2.
2) Determining the Constituent Sentences of the Normalized Version.

Constituent sentences of the normalized version may be identical with sentence parts of the original text; they may be slightly changed from sentence parts of the original text; they may be aggregates of original text sentences (with or without minor changes); they may be aggregates of sentence parts and syntactic words; or they may be derived from non-sentence parts of the original text. It becomes apparent that it is not enough simply to indicate syntax words, original text sentences, and sentence and non-sentence parts of original text sentences. The second step in the normalizing process is to decide how these various components can be transformed into the constituent sentences of the normalized version. In deciding, there will be need for the following criteria: (a) criteria for constructing constituent sentences from sentence parts of the original text, (b) criteria for determining non-sentence parts of original text sentences, (c) criteria for constructing constituent sentences from original text sentences, and (d) criteria for aggregating original text sentences. Such criteria are considered in what follows, and an example of aggregating in order to form a constituent sentence of the normalized version is provided.

a. Criteria for constructing constituent sentences from sentence parts of the original text

In Example I, original text sentence 1 was seen to be composed of five sentence parts (A, B, C, D, and E). Each of these sentence parts is treated as a constituent sentence of the following normalized version:

\[
\text{(1d)} \quad \text{a/ 1) the court shall deem it necessary, or} \\
\quad \text{2) the defendant shall so demand} \\
\quad \text{then} \\
\quad \text{b/ the jury of twelve freeholders shall be summoned, and} \\
\quad \text{2. if} \\
\quad\text{a/ a jury is required, then} \\
\quad\text{b/ such jury shall determine the sanity or insanity of the defendant.}
\]

\[
\text{(1n)} \quad 1. \text{If} \\
\quad \text{A} \\
\quad \text{B} \\
\quad \text{C} \\
\quad \text{D} \\
\quad \text{E}
\]
In this instance, the syntactic relationships among the sentence parts of original text sentence I—indicated in the original text by the syntax words "if," "or," "and," and "whenever"—are represented by the syntax words "if-then," "or," "and," and "if-then" in the normalized version. Sentence parts A, B, C, D, and E may be converted into constituent sentences of the normalized version precisely because the syntactic relationships among them are such that they can be represented by the syntax words of the normalized version.

This example demonstrates the criterion for constructing constituent sentences from sentence parts of the original text:

If and only if the syntactic relationship among A, B, C, . . . (sentence parts of an original text sentence) are such that they can be represented by the syntax words of the normalized version ("if-then," "and," "or," "it is not so that," and "if and only if-then") so that the original sentence and its normalized version both express the same idea, then each sentence part A, B, C, . . . is considered to be a constituent sentence of the normalized version.

Following are examples of syntax words in original text sentences which indicate syntactic relationships that can frequently be represented by the syntax words of the normalized version:

(i) "if," "whenever," "unless," "in case-then," "when," "where," "where-then," "only if," "except when," "provided that," "provided further that."

These terms can often be replaced by "if-then," "if and only if-then" or by the combinations of "if-then" and "it is not so that."

(ii) "and," "provided further that."

These terms can often be replaced by "and."

(iii) "or"

This can often be replaced by "or."

In two other instances, sentence parts must be aggregated in forming constituent sentences of a normalized version. These instances result from two types of syntactic ambiguity: ambiguity of a syntax word and ambiguity in grouping.

(i) The ambiguity of a syntax word
Ambiguity of a syntax word exists when it is uncertain which syntax or combination of syntax words is appropriate to use in constructing the normalized version as an appropriate representation of the original text. Consider the following:

Example 3

(3t) **Until** [such bond and advance payment are delivered to the medical superintendent.] [the insane person shall be admitted into the asylum only as a public patient.]

In this instance, sentence-parts A and B must be combined to form a constituent sentence of the normalized version, because the syntactic relationship between them—represented by the syntax word "until"—is ambiguous. It is uncertain whether (3t) is appropriately interpreted as asserting merely:

(3n.1) If it is not so that A, then B.

or whether it is appropriately interpreted as asserting the stronger proposition:

(3n.2) If and only if it is not so that A, then B.

Since it is uncertain as to which alternative is the appropriate way to normalize (3t) its sentence parts A and B should be aggregated and treated as one constituent sentence of the normalized version.

(ii) The ambiguity in grouping

Ambiguity in grouping exists when one cannot determine which two sentence parts of an original text sentence are related by a specific syntax word. Suppose the syntactic structure of the original text sentence is as follows:

In case A then B and C,

where A, B, and C represent sentence parts of an original text sentence. In this case, it is uncertain whether "and" represents the syntactic relationship of conjunction between B and C or between "In case A then B" and C. It is ambiguous whether the first conjunct is B or it is "In case A then B." Thus, in this example, all relevant sentence parts should be aggregated and treated as a single constituent sentence of the normalized version.
It is instructive to re-consider Example 1 in light of this criterion. Originally, (1t) was transformed into the normalized version:

\[
\text{(1d)} \quad \text{(1n)}
\]

But is it really unambiguously clear that (1n) is a more appropriate way to interpret (1t) than (1n.2)?

\[
\text{(1d.2)} \quad \text{(1n.2)}
\]

The existence of this alternative syntactic interpretation suggests that the A, B, C, . . . sentence-parts of (1t) should be aggregated into a single constituent sentence in the normalized version and that the various syntactic interpretations be shown in the interpretation section of the file, rather than in the normalization section.

b. Criteria for determining non-sentence parts of original text sentences

The above discussion has pointed out that syntactic relationships among sentence parts of original text sentences will determine the constituent sentences of the normalized version. But sentence parts and aggregates of sentence parts are only two types of constituent sentences which may appear.

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1. See p. 518 infra.
in a normalized version of a statute. We saw in Example 2 that constituent sentences of the normalized version may also be derived from non-sentence parts of the original text.

When should a segment of an original sentence be bracketed as a non-sentence part in order to indicate that it is to be converted to a constituent sentence of the normalized version? Since the conversion of a non-sentence part into a constituent sentence of the normalized version necessitates a change of wording from that of the original text, such a change may often distort the original meaning of the statute. The number of segments specified as non-sentence parts of original text sentences should therefore be minimized in order to avoid distortion of the ideas expressed in the original text. Portions of sentences shall be recognized as non-sentence parts of an original text sentence only when the following two conditions are fulfilled:

1. The analyst believes that the original meaning of the text will not be distorted by the conversion.
2. The conversion is necessary in order to put the original text into normalized form; i.e., the original text sentence becomes part of the antecedent or part of the consequent of an if-then statement, or the original text sentence itself becomes an if-then statement.

Example 2 illustrates the fulfillment of these two conditions. Since the original syntactic structure "F may do G" is converted into the form "if x is F then x may do G" in this example, this conversion does not distort the original meaning. In addition, since this conversion is necessary in order to get the normalized version into if-then form, the second requirement is also fulfilled.

c. Criterion for constructing constituent sentences from original text sentences

If none of the parts of an original text sentence is treated separately as a constituent sentence of the normalized version, then the original text sentence itself will be treated as a constituent sentence of the normalized version.

d. The criteria for aggregating original text sentences

It is stipulated that a constituent sentence of the normalized version is sometimes a sentence part, sometimes an
aggregate of sentence parts, and sometimes the transformed non-sentence parts of an original text sentence. It can also be an original text sentence or an aggregate of several original text sentences. In this section, situations in which original text sentences are aggregated in order to form a constituent sentence of the normalized version will be discussed.

There are certain syntax words of the original text sentence whose replacement by the syntax words of the normalized version is inappropriate ("until," "so long as," "to the extent that," etc.). The same situation may exist when a syntactic relationship is implicitly represented by a period. Sometimes the syntactic relationship between two original text sentences of the original text—represented by the period—cannot be represented adequately by the syntax words of a normalized version unless the original wording is radically changed. In such a case the relevant original text sentences will be aggregated and treated as a constituent sentence of the normalized version. Following are three such situations:

Example 4

The first original text sentence provides that a certain legal consequence (L1) follows if certain legal conditions (C1) are fulfilled. The second original text sentence provides that some different legal consequence (L2) follows if certain legal conditions (C2) are fulfilled. This second original text sentence also provides implicitly that even if C1 is fulfilled, L2 (not L1) follows if C2 is fulfilled. In short, the second original text sentence provides for an exception to the first original text sentence. For example,

First sentence: A defendant shall serve his answer within 20 days after the service of the summons and complaint upon him.

Second sentence: The United States shall serve an answer to the complaint within 60 days after the service upon the United States Attorney.

The first sentence provides that if a person is a defendant (C1) he shall serve his answer within 20 days (L1). The second sentence provides for an exception to the first sentence and specifies that if the defendant is the United States (C2), then he shall have 60 days (rather than 20 days) to serve his answer (L2).

When such a relationship exists between two original text sentences, it is inappropriate to treat each sentence as a
constituent sentence of the normalized version and to represent their relationship by "and" because if they are so represented, the qualification of the first sentence by the second sentence is left implicit and the actual relationship between the two sentences has not been clarified.

Thus the following normalization would be inappropriate:

(4d) \[
\text{\begin{align*}
& A \\
& \quad \quad B, \\
& \quad \quad C
\end{align*}}
\]

(4n) \[
\text{\begin{align*}
& \text{If} \\
& 1/ \text{certain conditions are fulfilled, then} \\
& 2/ \text{a. a defendant shall serve his answer within 20 days after the service of the summons and complaint upon him, and} \\
& \quad \text{b. the United States shall serve an answer to the complaint within 60 days after the service upon the United States attorney.}
\end{align*}}
\]

From this normalized version, the following statement can be deduced:

If certain conditions are fulfilled, then a defendant shall serve his answer within 20 days after the service of the summons and complaint upon him.

But this statement is simply not true if the defendant is the United States. So the normalization is inappropriate and the two specified sentences must be normalized in a different way. One alternative would be to normalize these sentences as follows:

(4d.2) \[
\text{\begin{align*}
& A \\
& \quad \quad B, \\
& \quad \quad \quad \quad D \\
& \quad \quad \quad \quad C \\
& \quad \quad \quad \quad E
\end{align*}}
\]

(4n.2) \[
\text{\begin{align*}
& \text{If} \\
& 1/ \text{certain conditions are fulfilled, then} \\
& 2/ \text{a. if} \\
& \quad 1/ \text{a person is a defendant, and} \\
& \quad \quad \text{b. such person is not the United States,} \\
& \quad \quad \quad \text{then} \\
& \quad \quad \quad \text{2/ he shall serve his answer within 20 days after the service of the summons and complaint upon him, and} \\
& \quad \quad \quad \text{b. if} \\
& \quad \quad \quad 1/ \text{the person is United States,} \\
& \quad \quad \quad \quad \text{then} \\
& \quad \quad \quad \quad \text{2/ he shall serve his answer to the complaint within 60 days after the service upon the United States attorney.}
\end{align*}}
\]
However, this is so radical a change from the original text that it violates the first principle in normalizing: minimum change of wording.

These considerations lead to the conclusion that these two original text sentences should be aggregated to express the general rule and exception and should be treated as one constituent sentence of the normalized version; the relationship between the parts of the constituent sentence can then be analyzed later at the interpretation stage.

**Example 5**

The first original text sentence provides that a certain legal consequence (LI) shall follow if a certain legal condition is fulfilled; the second original text sentence qualifies this legal consequence. For example,

First sentence: If certain conditions are fulfilled, then the counties of settlement of an alleged insane person shall be liable for the care and maintenance of such person.

Second sentence: No county shall be liable for the care and maintenance of any insane person for more than a total of one year.

If these two sentences are normalized as follows,

(5d) If
   \[
   \begin{align*}
   & \text{A} \\
   & \downarrow \\
   & \text{B,} \\
   & \text{C}
   \end{align*}
   \]

(5n) If
   \[
   \begin{align*}
   & 1/ \text{certain conditions are fulfilled} \\
   & \text{then} \\
   & 2/ \text{a. the counties of settlement of an} \\
   & \text{alleged insane person shall be} \\
   & \text{liable for the care and mainte-} \\
   & \text{enance of such person, and} \\
   & \text{b. no county shall be liable for the} \\
   & \text{care and maintenance of any in-} \\
   & \text{sane person for more than a total} \\
   & \text{of one year,}
   \end{align*}
   \]

the same difficulty occurs as in *Example 4*. Thus these two original text sentences, "the counties of settlement . . . such person" and "no county . . . of one year," should be aggregated and treated as a single constituent sentence of the normalized version.

**Example 6**

The first original text sentence provides that a certain legal consequence shall follow if a certain legal condition is fulfilled. The second original text sentence, supplementing the first one, tries to eliminate certain ambiguities of the first sentence. For example,
First sentence: The patient, husband, wife, father, and mother shall jointly and severally be liable for the care and maintenance of any patient.

Second sentence: No divorce shall operate to relieve the spouse of a patient from this liability for such care and maintenance.

In this example, the second sentence asserts the continuing liability of a spouse, even in the event of a divorce. For the reasons mentioned with respect to Example 4, it is inadequate to treat each original text sentence as a constituent sentence of a more comprehensive normalized statement and to represent the syntactic relationship between the constituent sentences by "and" because that does not clarify their relationship; but neither can a normalized version be built out of the two sentences alone because that involves too much change in wording of the original text. The risk is too great that the normalized version if these sentences were transformed into the following:

\[
(6d) \quad (6n) \quad \begin{array}{l}
\text{If} \\
\text{a person is the patient, or} \\
\text{the father or mother of the patient, or} \\
\text{1. a person is the husband or wife of the patient and} \\
\text{2. whether he is subsequently divorced or not} \\
\text{then} \\
\text{2/ such persons shall jointly and severally be liable for the care and maintenance of the patient.}
\end{array}
\]

Such a transformation, however, is too radical a change of wording of the original text. The risk is too great that the analyst will inadvertently build in some subtle shift in meaning. So, the appropriate course is to aggregate the two original text sentences into one constituent sentence of the normalized version and to analyze their relationship at a later interpretation stage.

In addition to aggregating original text sentences, it may sometimes be appropriate to aggregate sentence parts. The following example is one that may involve aggregation of
sentence parts. Suppose the syntactic structure of an original text sentence is:

\[ \text{A and B} \]

where sentences A and B are sentence parts of the original text sentence and a non-sentence part of A qualifies not only the remaining part of sentence part A but also sentence part B. The following example illustrates such a syntactic structure:

**Example 7**

[At the request of the medical superintendent, the court shall require the persons executing such bond to justify their responsibility anew,] \textit{and} [the insane person shall, from the time of such request, be regarded as a public patient.]

Here, "the request of the medical superintendent" is clearly a condition for regarding the insane person as a public patient as well as for requiring the justification of the responsibility. It would be inadequate to treat each sentence part of the original text sentence as a constituent sentence of a more comprehensive normalized version and to represent the syntactic relationship between the parts by "and"—if there is such a relationship between these constituent parts of the original text—because such a normalized version would not express the situation that a non-sentence part of A qualifies B. This situation can be adequately handled by either of two methods. The first method is to treat "At the request of the medical superintendent" as a non-sentence part. If this method is used, the example sentence would be normalized as follows:

(7d) \[ \text{If} \]

\[ \begin{array}{c}
\text{A} \\
\downarrow \\
\text{B}, \\
\downarrow \\
\text{C}
\end{array} \]

(7n) \[ \text{If} \]

\[ \begin{array}{c}
1/ \text{the medical superintendent makes the request,} \\
\text{then} \\
2/ \text{a. the court shall require the persons executing such bond to justify their responsibility anew,} \\
\text{and} \\
\text{b. the insane person shall, from the time of such request, be regarded as a public patient.}
\end{array} \]

The conversion of a non-sentence part into a constituent sentence of the normalized version, however, may result in distorting the meaning of the original text. If the analyst believes that such a distortion results, then the aggregate of the
two sentence parts of the original text sentence should be treated as a constituent sentence of the normalized version and the alternatives analyzed at the interpretation stage.

3) Representing Syntactic Relationships in the Normalized Version.

After the constituent sentences of the normalized version are determined, the last step of the normalization process is to represent their syntactic relationships visibly and unambiguously. Three devices are used for this purpose: (a) syntactic words of the normalized version, (b) itemization, and (c) diagrams of the normalized version.

a. Syntax words of the normalized version

The syntax words of the normalized version are at present limited to the five sets of words "and," "or," "if-then," "if and only if-then" and "it is not so that." The syntactic relationships among constituent sentences will be expressed by one or more of them.

b. Itemization

1.
   a/ 1)
   b/

2.
   a/
   b/

The above is from the normalized version of Example 1 and will be called the itemization of Example 1. This itemization serves to facilitate clear and unambiguous expression of the syntactic relationships among constituent sentences.

The signs in the itemization signal the syntax words of the normalized version, as follows:

<table>
<thead>
<tr>
<th>Syntax Words of the normalized version signaled</th>
<th>Signals of the itemization</th>
</tr>
</thead>
<tbody>
<tr>
<td>and</td>
<td>.</td>
</tr>
<tr>
<td>or</td>
<td>)</td>
</tr>
<tr>
<td>if-then</td>
<td>/</td>
</tr>
<tr>
<td>if and only if-then</td>
<td>//</td>
</tr>
</tbody>
</table>
The indentation of the itemization serves the same purpose that parentheses serve in mathematical expressions, namely, to indicate how parts are related. Thus the syntactic relationships among constituent sentences of the normalized version are represented by the itemization as well as by the diagram. For example, the itemization of Example 1 shows the following syntactic relationships:

(If (A or B) then C) and (if D then E)

c. Diagram

The diagram of the normalized version also increases the visibility of the syntactic relationships. The syntax words of the normalized version shall be represented in the diagram by the signs indicated:

<table>
<thead>
<tr>
<th>Syntax Words of the normalized version</th>
<th>Equivalent signs of the diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>and</td>
<td>antecedent</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>not, it is not so that</td>
<td></td>
</tr>
<tr>
<td>if-then</td>
<td></td>
</tr>
<tr>
<td>if and only if-then</td>
<td></td>
</tr>
</tbody>
</table>

II. Filing Statutory Revisions and Judicial or Administrative Interpretations of a Statute

A. The General Features.

The procedure for filing revisions and interpretations of a statute consists of only two steps: (1) putting an asterisk at the appropriate place on the diagram of the normalized version or interpretation to signal the existence of interpretations and revisions and (2) filing the interpretation or revision on a different page in compliance with an appropriate format.

Suppose a diagram and normalization of a provision are as follows:
where A, B, C are constituent sentences of the normalized version. Now suppose a court decision interpreted A and stated that "if A then A." For example, if A is the constituent sentence "the person is a parent," then "if A then A" might be "if the person is a foster father, then the person is a parent." This interpretation will be filed as follows:

1. An asterisk is put to the right of A in the diagram of the normalized version because A corresponds to constituent sentence A which has been interpreted. (SEE DIAGRAM ABOVE)

2. This interpretation is then filed on a different page as follows:

As will be explained later, there are several formats for interpretation and revision pages. The interpretation "if A then A" is filed in compliance with the format which is appropriate for this type of interpretation, i.e., an if-then interpretation of part of an antecedent.

Thus, if a user of this file wants to know if A has been interpreted or revised, he will first check the diagram of the normalized version. If he finds an asterisk signaling interpretations or revisions of A, he can then proceed to page 8A* to find the interpretation (or revision).

In the succeeding sections, we shall explain (1) where to
place an asterisk on a diagram and (2) the formats appropriate to different kinds of interpretations and revisions.

B. The Appropriate Place to Put an Asterisk.

The asterisk signalling the existence of revisions or interpretations of a constituent sentence should generally be put to the right of the sentence label representing the sentence to be interpreted or revised. (There are instances, however, in which it will be put to the left of the label.) Thus, suppose a normalized version is as follows:

\[(9d)\]
\[
\begin{array}{c}
A^* \\
\downarrow \\
B, \\
C^* \\
\end{array}
\]

\[(9n)\] A. If 1/ A, then 2/ a. B, and b. C.

To signal the existence of interpretations or revisions of A, an asterisk, is placed to the right of A. Also, an asterisk is placed to the right of C to signal the existence of interpretations or revisions of C.

Now, suppose that an interpretation of A—e.g., “if A then A”—is filed on page 9A* as follows:

\[
\begin{array}{c}
\rightarrow 9A \\
\downarrow \\
1 \\
\end{array}
\]

\[
9A^* \]

To signal the existence of an interpretation of A, an asterisk is placed to the right of the 1 in the diagram, indicating that at least one interpretation of A is filed on page 9A* (or on other pages related to 9A*, i.e., N9A*, or N-N9A*).

Sentences that are conjuncts of conjunctions or that are disjuncts of disjunctions are the ones that pose problems with respect to where the asterisk should be placed to signal an interpretation because sometimes we will want to interpret the whole disjunction or the whole conjunction and the asterisks...
signaling those interpretations might easily be confused with those signaling interpretation of the individual conjuncts or the disjuncts. To differentiate the two, the asterisks for indicating interpretations (or revisions) of the conjunction are placed to the left of the first conjunct of the conjunction in the diagram, and, similarly for disjunctions. The asterisks for signaling interpretations of the conjuncts or the disjuncts are placed in the customary spot to the right of the sentence label in the diagram. Hence, a revision of the antecedent of (10d)—the conjunction, A and B—by adding to it another conjunct D, is indicated as follows:

\[
\begin{array}{ccc}
  (10d) & \downarrow & (10n) \\
  & *A, & \\
  & B & \\
  & \downarrow & \\
  & C & \\
\end{array}
\]

As will be more fully explained later, the added sentence D will be filed on page 10(A . . . B)* as follows:

\[
\begin{array}{ccc}
  & \downarrow & \\
  & A, & \\
  & B, & \\
  & \downarrow & \\
  & D, & \\
\end{array}
\begin{array}{ccc}
  & \downarrow & \\
  & 1/ a. & \\
  & b. & \\
  & c. & \\
  & \downarrow & \\
  & D & \\
  & \downarrow & \\
  & 2/ C. & \\
\end{array}
\]

If the antecedent conjunction of 10 is later revised again by deleting sentence B, this deletion is signaled by an asterisk to the left of the A in the diagram on page 10(A . . . B)*, and the deletion will be filed on that same page as follows:

\[
\begin{array}{ccc}
  & \downarrow & \\
  & A, & \\
  & B, & \\
  & \downarrow & \\
  & D, & \\
\end{array}
\begin{array}{ccc}
  & \downarrow & \\
  & 1/ a. & \\
  & b. & \\
  & c. & \\
  & \downarrow & \\
  & D & \\
  & \downarrow & \\
  & (deleted) & \\
\end{array}
\]
To summarize, interpretations and revisions, which may be either additions or deletions or both, are added to the file in such a way that their relationship to constituent sentences of normalized versions of the statute (or other norm) are indicated by the page names where those entries are made. Such interpretations or revisions are signaled by an asterisk placed next to the diagram: to the right of the diagram when the interpretation or revision refers to an individual constituent sentence and to the left of the diagram when it refers to a conjunction or a disjunction (and also to the left when it refers to an implication or a co-implication, i.e., an if-then compound sentence or an if-and-only-if-then compound sentence).

C. Formats of Interpretation and Revision Pages.

Suppose, again, that the structure of a normalized version is as follows:

```
(11d) If A, then B, and C.
(11n) 1/ A, then 2/ a. B, and b. C.
```

The antecedent of this implication is A, and (B and C) is the consequent. An example of a normalized version of this structure is as follows:

```
(11d) If A, then B, and C.
(11n) 1/ the person is a parent, then 2/ a. the person shall support his minor children, and b. the person may represent his minor children on juristic acts concerning their property.
```

For purposes of filing, interpretations and revisions are classified into three categories, the second of which is subdivided into two sub-categories.

1. Interpretations and revisions of a constituent sentence in the antecedent of an implication, e.g., A above.
2. Interpretations and revisions of a constituent sentence in the consequent of an implication, e.g., B above.
   a. Interpretations about what acts constitute the fulfillment of an obligation or the exercise of a power.
   b. Interpretations about what results from a constituent sentence in the consequent and revisions of a constituent sentence in the consequent.

3. Interpretations and revisions which add a constituent sentence to or delete a constituent sentence from the antecedent or consequent.

In what follows each category and sub-category is discussed and the format for each of them is explained:

1. Interpretations and Revisions of a Constituent Sentence is an Antecedent of an Implication.

Interpretations of an antecedent of an implication are of four types:

a. Indications that specified circumstances result in the fulfillment of a condition described by a given sentence in the antecedent.

\[ \Rightarrow A1 \rightarrow A \]

b. Indications that it is not so that specified circumstances result in the fulfillment of a condition described by a given sentence in the antecedent.

\[ \neg \Rightarrow A2 \rightarrow A \]

c. Indications that specified circumstances result in the nonfulfillment of a condition described by a given sentence in the antecedent.

\[ \Rightarrow A3 \rightarrow \neg A \]

d. Indications that it is not so that specified circumstances result in the nonfulfillment of a condition described by a given sentence in the antecedent.

\[ \neg \Rightarrow A4 \rightarrow \neg A \]

Examples of each type of this category are as follows:

a. If
   a. the person is a foster father,
   then
b/ the person is a parent.

b. It is not so that if
   a/ the person is the husband of a mother
      then
   b/ the person is a parent.

c. If
   a/ the person is not a blood relative of a child,
      then
   b/ the person is not a parent.

d. It is not so that if
   a/ the person is not a blood relative of a child,
      then
   b/ the person is not a parent.

These types of interpretation will be filed in formats of the following types:

In place of X, a sentence label for the sentence being interpreted or revised will be inserted. In place of y, a numeral will be inserted if the last symbol of the sentence label is a letter, or a letter will be inserted if the last symbol of the.
sentence label is a number. The number 1 or the letter a will be inserted when the first interpretation is entered on one of these four types of pages, 2 or b for the second interpretation, and so on. If the same interpretation is entered more than once, on the same or different types of pages, the number or letter used in the former interpretation is used again.

Using these four formats, the preceding examples would be filed as follows:

![Diagram]

The statutory revisions of A will also be filed on the page A*. Thus, if “the person is a parent” is later revised to “the person is a parent or grandparent,” this revision will be filed as follows:

![Diagram]
The \( \rightarrow \) "R30" in this diagram indicates that "the person is a parent or grandparent" is the statutory revision of 1930. This revised provision will be inserted on the N-x, Nx, or N-Nx pages only if and when interpretations of this revised provision are filed on such pages.

Thus, for example, if this 1930 revision is interpreted as follows:

\[
\begin{align*}
\text{If} \\
1/ & \text{ the person is a great-grandparent,} \\
\text{then} \\
2/ & \text{ it is not so that the person is a parent or grandparent,}
\end{align*}
\]

then this interpretation will be filed as follows:

2. Interpretations and Revisions of a Constituent Sentence in the Consequent of an Implication.

a. Interpretations of what acts constitute the fulfillment of an obligation or the exercise of a power.

Interpretations of this sub-category will be of four types:

1. Indications that a specific type of act constitutes the fulfillment of an obligation or the exercise of a power.
2. Indications that it is not so that a specific type of act constitutes the fulfillment of an obligation or the exercise of a power.
3. Indications that a specific type of act constitutes the violation of an obligation or the non-exercise of a power.
4. Indications that it is not so that a specific type of act constitutes the violation of an obligation or the non-exercise of a power.
Examples of each type of this sub-category are:

1. If
   a/ the person who is a millionaire furnishes his children with money for living the middle-class life,
   then
   b/ the person fulfills the obligation that he shall support his minor children.

2. It is not so that if
   a/ the person declares his intention to sell the property of his minor children
   then
   b/ the person exercises his power to represent his minor children on juristic acts concerning their property.

3. If
   a/ the person does not provide enough food for his minor children,
   then
   b/ the person violates his obligation that he shall support his minor children.

4. It is not so that if
   a/ the person declares his intention to sell the property of his minor children with the consent of the latter
   then
   b/ the person does not exercise his power to represent his minor children on juristic acts concerning their property.

Although these interpretations refer to the constituent sentence “the person shall support his minor children” or “the person represents his minor children on juristic acts concerning their property” which appear in the consequent of a normalized version of a statute, the sentences in the consequents of these interpretations are different from their corresponding sentences in the normalized version. Hence, we cannot use the same sentence labels for the former that we used for the latter. The adoption of entirely new sentence labels for the consequents of the interpretation, however, would sever the relationship between labels of the sentences in the normalized version and the labels of interpretations of this type. Thus, we want to change the wordings of the consequents of these interpretations, without distorting their original mean-
ing so that we may use similar sentence labels for the corresponding constituent sentence in the normalized version and the consequents of the interpretations.

Consider the interpretation of Example I. This interpretation asserts that a certain type of act (a millionaire's furnishing his children with money for living the middle-class life) fulfills his obligation in this particular norm "to support his minor children." Since to say "the person fulfills the obligation that he shall support his minor children" is to say "the person supports his minor children," the latter may replace the former in Example I, to obtain:

1.2
If
a/ the person who is a millionaire furnishes his children with money for living the middle-class life,
then
b/ the person supports his minor children.

The consequent of this sentence differs from the corresponding sentence in the normalized version (i.e., "the person shall support his minor children") only in that the former is a descriptive sentence while the latter is a prescriptive sentence. We shall refer to the former as the descriptive correlate of the latter, and the latter as the prescriptive correlate of the former. It is stipulated that the sentence label of the descriptive correlate of a prescriptive sentence is its sentence label plus #. Thus, for example, if the sentence label of a prescriptive sentence is A2, then the sentence label of its descriptive correlate is A2#. With this stipulation, we can use the formats of C1 to file the transformed sentences of C2a. Thus the examples described above will be filed as follows:

1.2
A #
1
(1) The person supports his minor children,
if
(2) a person who is a millionaire furnishes his children with money for living the middle-class life,
2. It is not so that
   (1) the person represents his minor
       children on juristic acts concern-
       ing their property,
   if
   (2) the person declares his intention
to sell the property of his minor
   children,

3. The person does not support his
   minor children,
   if
   (2) the person does not give enough
   food for his minor children,

4. It is not so that
   (1) the person does not represent his
       minor children on juristic acts
       concerning their property,
   if
   (2) the person declares his intention
to sell the property of his minor
   children with the consent of the
   latter.

b. Interpretations about what results from a sentence in a consequent, and revisions of a sentence in a consequent.

Interpretations as to what results from a given consequence will be of two types:

1. Indications that a sentence in a consequent implies another sentence, and

2. Indications that it is not so that a sentence in a consequent implies another sentence.

Type 1 includes three different kinds of interpretations. The first kind simply clarifies the content of the norm prescribed by the sentence in a consequent. For example:

If
a/ the person shall support his minor children,
then
b/ the person shall support his children who are less than 20 years old.

The second kind specifies the legal consequence of the exercise of the power or the violation of the obligation that results from the sentence in the consequent. Examples of this kind are:

If
  a/ the person may represent his minor children on juristic acts concerning their property,
  then
  b/ if
    1/ the person represents his minor children on juristic acts concerning their property,
    then
    2/ his children are bound by his juristic acts.

If
  a/ the person shall support his minor children,
  then
  b/ if
    1/ the person does not support his minor children,
    then
    2/ the family court shall order him to support his minor children.

The third kind is the clarification of the syntactic relationship among various parts of a constituent sentence. It was mentioned above that several constituent sentences of the original text may be aggregated to form a constituent sentence of the normalized version. The interpretations of such a constituent sentence to clarify the syntactic relationships among the various parts are of this third kind.

Type 2 includes two different kinds of interpretations: (1) the denial of the assertion that a certain norm results from the norm prescribed by the sentence in a consequent, and (2) the denial of the assertion that the exercise of the power or the violation of the obligation which is authorized or imposed by the sentence in the consequent brings about certain legal consequences. The examples of type 2 are:

It is not so that if
  a/ the person shall support his minor children,
  then
  b/ the person is permitted to punish them.

2. Supra p. 499.
It is not so that if
a/ the person shall support his minor children
then
b/ if
1/ the person does not support his minor children
then
2/ he is a criminal.

The formats for filing interpretations of Type 1 and Type 2 are:

Using these two formats, the preceding examples will be filed as follows:

Note that sentence A is interpreted twice, that the first interpretation clarifies the meaning of "his minor children" while the second interpretation specifies the legal consequence of the violation of the obligation.
If
(1) the person may represent his minor children on juristic acts concerning their property,
then
(2) if
a/ the person represents his minor children on juristic acts concerning their property,
then
b/ his children are bound by his acts.

It is not so that if
(1) the person shall support his minor children,
then
(2) the person is permitted to punish them, and
(3) if
a/ the person does not support his minor children,
then
b/ he is a criminal.

3. Interpretations and Revisions Which Add a Sentence to or Delete a Sentence From an Antecedent or Consequent.

Some statutory revisions will be expressed most adequately if a constituent sentence of the normalized version is added to or deleted from the antecedent or consequent of the existing normalized version. For example, suppose the italicized portions of the following are added by a statutory revision of the original text:

Example 12
(12t)
The parent shall support his minor children if he is financially capable to support, and he may represent his minor children on juristic acts concerning their property. The parent has the right and duty to educate his minor children.

This revision would be expressed adequately by rewriting the normalized version as it appeared in the file before the
revision was made and adding two constituent sentences. The resulting revised normalized version would be:

(12d) $\rightarrow$

(12n) If

1/ the person is a parent,

then

2/ a. if

1/ he is financially capable to support,

then

2/ he shall support his minor children, and

b. he may represent his minor children on juristic acts concerning their property, and

c. he has the right and duty to educate his minor children.

Such rewriting, however, is often extremely difficult if the normalized version is long, and it often brings about extensive changes of sentence labels. This, in turn, requires extensive cross referencing to relate past entries in the file to any new entries that may be made to the relabeled sentences, making the file more cumbersome and difficult to work with. For this reason, additions and deletions will be filed on an appropriately labeled page, and an asterisk put at the left of the label for the conjunction, disjunction, or implication to or from which the relevant sentence is added or deleted. The normalization of the original text before the revision that resulted in Example 12 would have been as follows:

When the revision occurred, the asterisk to the left of the "B" in the diagram would be added and the following entry would be made on page 12(B. . .C)*:
Similarly, adding a sentence to a conjunction, disjunction, or implication of the normalized version is sometimes the best way to represent some types of interpretation that are expressed in regulations, judicial opinions, or other documents. Suppose that a court, considering this provision and other provisions prescribing the legal consequences of the declaration of incompetency, decided that the parent who is declared to be incompetent does not have the obligations and powers prescribed above. This interpretation will be filed most adequately if the non-existence of the declaration of incompetency is inserted in the antecedent of the normalized version as the second condition of the prescribed obligations, powers, etc.

Filing these types of revisions and interpretations will now be explained.

4. Addition of a Sentence to an Existing Conjunction or Disjunction as a Conjunct or a Disjunct, and Deletion of a Sentence. Two examples of this type are:

Example 13

(12d) If

(12n) If

12(B . . . C)*

1/ (A)

then

2/ a. if

1/ he is financially capable to support,

then

2/ (B), and

b. (C), and

c. he has the right and duty to educate his minor children.

(13.d) If

(13n) If

13

1/ A,

then

2/ a. B, and

b. C.
If D is added to the consequent as a conjunct and E is added as a condition of B, then an asterisk is placed (as shown) to the left of the B in the diagram on page 13, and the following entries are made on page 13(B. . .C)*:

(13d)

\[
\begin{array}{c}
\text{A} \\
\downarrow \\
\begin{array}{c}
\text{E} \\
\downarrow \\
\text{B} \\
\text{C} \\
\downarrow \\
\text{D}
\end{array}
\end{array}
\]

(13n)

If

1/ then
2/ a. if
1/ E
then
2/ b. 
c. D.

(13(B. . .C)*)

If F is added to the antecedent of 13 as another conjunct, then an asterisk is placed (as shown) to the left of the A in the diagram on page 13, and the following entry is made on page 13(A. . .)*:

(13d)

\[
\begin{array}{c}
\text{A,} \\
\downarrow \\
\text{F} \\
\downarrow \\
\begin{array}{c}
\text{B} \\
\text{C}
\end{array}
\end{array}
\]

(13n)

If

1/ a. 
b. F
then
2/ a. 
b.

(13(A. . .)*)

Example 14

(14d)

\[
\begin{array}{c}
\text{A} \\
\downarrow \\
\text{B} \\
\downarrow \\
\text{C}
\end{array}
\]

(14n)

If

1/ a. A, or 
b. B
then
2/ C.

(14)
III. IMPLICATIONS OF A NORMALIZED-SENTENCE STORAGE AND ANALYSIS FILE

The Normalized-Sentence Storage and Analysis File is intended to improve the communication network involving legal literature by expressing its messages in a form that will facilitate their storage, retrieval, and analysis. In an NSSA File, the information contained in a statute and in legal literature interpreting that statute is organized so that (1) the syntactic relationships among the various parts of a statute are expressed visibly and unambiguously in the normalized version, and (2) each constituent sentence of the normalized version is used as a major indexing category. Interpretations and revisions of the statute are filed categorically and chronologically under the relevant major indexing category, and a sentence interpreting or revising the statute may also be used as an indexing sub-category under which interpretations are filed. This basic characteristic of such a file will facilitate finding relevant literature and will encourage improvement of legal analysis by (1) organizing and making evident the chronological order of constitutional and statutory revisions, judicial decisions, administrative rulings, and other legal
literature, (2) spotlighting the interaction between the legislature, the courts, administrative officers, and other legally significant personnel, (3) simplifying the expression of necessary and sufficient conditions for reaching specified legal consequences as expressed in the evolving legal literature and thus providing a more comprehensive and comprehensible image of the legal state of affairs at a given point in time, and (4) detecting and making possible the elimination of inadvertent syntactic ambiguities thereby encouraging improvement of legal drafting.

It is often important in legal practice to ascertain the chronological order of statutory revisions, judicial decisions, and administrative rulings, since a judicial decision may have been overruled by a statutory revision, and an administrative ruling by a statutory revision or judicial decision. In an NSSA File, the revisions of a part of a statute are filed chronologically on the same page as their interpretations; thus there is no difficulty in ascertaining their chronological order, however frequent the revisions may be.

Section 11 of the Michigan Mental Health Law 1923 and its subsequent interpretations and revision furnishes illustration of such chronology. It provides in part:

such notice shall be served personally upon the father, mother, husband, wife, or some one next of kin, of full age, of such alleged mentally diseased person, if there be any such known to be residing within the county.

This provision was interpreted by Judge North in In re Roth to mean that such notice shall be served personally upon at least one of the persons qualified by this provision. In 1949, this provision was revised by the legislature as follows: (italics added)

such notice shall be served personally upon the father, mother, husband, wife, and upon the next of kin who are of full age of such alleged mentally diseased person, if there be any such known to be residing within the county.

This revision is clearly intended to overrule the Roth case; it

requires the service of the personal notice to all of the persons enumerated in this provision.

This example also illustrates some of the difficulties involved in eliminating syntactic ambiguity. This revised provision, in eliminating one syntactic ambiguity, created another. Hence this revised provision can be interpreted in either of the following two ways:

(1) If
   a/ the father, mother, husband, wife, or the next of kin are of full age of such alleged mentally diseased person are known to be residing within the county,
   then
   b/ such notice shall be served personally upon each of them,
   or
(2) a. Such notice shall be served personally upon the father, mother, husband, wife, and
   b. if
      1/ next of kin who are of full age of such alleged mentally diseased person are known to be residing within the county,
      then
      2/ such notice shall be served personally upon each of them.

Section 11 of the Michigan Mental Health Law also prescribes the procedure to determine the question of mental illness. It provides:

The court shall also institute an inquest, and take proofs, as to the alleged insanity, feeble-mindedness, epilepsy or mental disease of such person, and fully investigate the facts before making such order [the order to admit a person to a state mental hospital, etc.].

Between 1936 and 1953 there were 13 decisions reviewing whether the investigations of probate courts had fulfilled this requirement. In 1956, the legislature revised the statute to provide that the alleged mentally diseased person shall be removed to a regional diagnostic center, for diagnostic care and treatment for 60 days and that upon the recommendation of the superintendent of the center the probate court or jury shall determine if the alleged mentally diseased person is really mentally diseased. Although the 1956 revision still preserves the provision, "[t]he court shall also take proofs as to the alleged mental condition or epilepsy of such person, and fully investigate the facts," it can be argued that the degree of
investigation required of the court by the statute is reduced because the 1956 revision seems to be intended to shift the primary responsibility of determining mental illness from the court to the regional diagnostic center. This suggests that the relevance and weight of the 13 decisions that occurred during the 1936-53 period is significantly impaired. An NSSA File would make this evident.

Turning to the second factor associated with an NSSA File that facilitates legal analysis, if a statute and its interpretations are organized categorically and chronologically, interactions among the legislature, courts, attorney general, and scholars are often more apparent. For instance, in the 13 decisions mentioned above, consider whether a probate court had fully investigated the facts before making the order of admission to a state mental hospital. The Supreme Court of Michigan decided, in 11 of the cases, that the probate court had not fully investigated the facts, and voided the orders of the probate court. In many cases in which the investigation by the probate court was determined to have been insufficient, the determination of mental illness was based solely or mostly on the two certificates of reputable physicians which stated that the alleged mentally diseased person was mentally ill. Although the Supreme Court of Michigan has repeatedly decided that the certificates of physicians are not sufficient to satisfy the stipulation to "fully investigate the facts," the probate courts persistently overlooked the decisions of the Michigan Supreme Court. This interaction between the Michigan Supreme Court and the probate courts is quite evident from an NSSA File of the relevant statutory and case literature. This data might create the suspicion that probate courts are generally doing an unsatisfactory job of determining the existence of mental illness. A second thought, however, might suggest that the statute and its interpretation by the Supreme Court impose too great a burden upon the probate courts. Considering the technical nature of determining the question of mental illness, one might raise some question about the competence of the probate court judge or jury to make the determination. Heavy reliance on the certificates of
physicians might be the natural tendency of a probate court faced with actually deciding the question of mental disease.

The 1956 revision concerning the procedure to determine the question of mental disease appears to be the reaction of the legislature to this problem. Perhaps admitting the inappropriateness of the probate court's determining the question of mental disease and also perhaps admitting the insufficiency of the two certificates of physicians has lead the legislature to create the new procedure, viz, 60 days examination by a specialist in a regional diagnostic center. The interplay between the various courts and the legislature is made evident in an NSSA File.

The third factor contributing to better legal analysis is the clarity of statement of norms in an NSSA File. Lawyers repeatedly need information from statutes and their judicial or administrative interpretations, to ascertain what particular set of conditions is sufficient or necessary to bring about a given legal consequence and what set of consequences result from fulfillment of a given set of conditions. This information is not always easily acquired, however, if the statute is complicated or if its interpretations are voluminous. Two difficulties intervene: ascertaining all of the exceptions and limitations to a provision, and organizing retrieved provisions and interpretations so that the researcher can readily perceive the pertinent information. Following is a discussion of these problems and of how an NSSA File aids in solving them.

Section 11 of the Michigan Mental Health Law is relevant again as an illustration. It provides that if a qualified person petitions the probate court for an order directing the admission of a person to a state mental hospital, then the probate court shall start a procedure to determine that person's sanity or insanity. On the other hand, § 17241 of Comp. Laws of Michigan 1940 provides that if a person accused of any felony shall appear to be insane the court (of criminal jurisdiction) shall ascertain the issue of insanity.

As interpreted in People v. Backhaut5 § 17241 should be considered an exception to § 11, but without cross-reference a researcher working on § 11 may not be aware of § 17241. The relationships among § 11, § 17241, and the Backhaut

---

case could be easily expressed in an organized manner in anNSSA file, however:

The normalized version of § 11 of the Michigan Mental Health Law would be:

**Example 15**

```
(15d) If
  * A
  ↓ B,
  ↓ C,

(15n) If
  1/ an appropriate petition is filed by a qualified person, then
  2/ a. the probate court shall institute proceedings to determine sanity or insanity, and
      b. ...

Since § 17241 is interpreted to be an exception to this provision, the absence of accusation of any felony by the alleged mentally diseased person should be added as another condition of the antecedent of this implication. An asterisk should be placed (as shown) on page 15 and this other condition should be shown on page 15(A. . .)* as follows:

```
(15d) If
  A
  ↓ D
  ↓ B,
  ↓ C,

(15n) If
  1/ a. (A), and
      b. it is not so that the alleged mentally diseased person is accused of an felony,
  then
  2/ a. (B), and
      b. (C)
```

In using the NSSA File, a researcher who wants to know under what conditions the probate court has jurisdiction to determine the question of mental illness will easily discover this added condition if he checks the normalized version of
§ 11 and its interpretations and revisions. Since the relevant part of the opinion in the *Backhaut* case and the provision of § 17241 are also reproduced as justifications of this insertion, the researcher can check the appropriateness of this insertion by examining the original texts. Since exceptions and limitations of a provision will be incorporated into the normalized version of the general rule provision in this way, the researcher's burden of searching relevant provisions will be much reduced once this file is completed.

With the present organization of legal literature, even if they retrieve all of the relevant provisions and interpretations, researchers have difficulty in ascertaining (a) the conditions sufficient to produce a given legal consequence and (b) the legal consequences that result from a certain set of conditions. Suppose that a researcher retrieved the following four provisions:

General Rule: If C1 or C2, then L1.
Special Rule: If C3, then L2.
Exception to Special Rule: If C4, then L1.
Limitation to General Rule: If C5, then NL1.

He would need to undertake the customary reading and rereading (and sometimes even re-reading again) in order to carefully puzzle out and piece together exactly what was required before legal consequence L1 was to result. The need for such pain-staking analysis will be greatly reduced if these sentences are organized as shown in the diagram to the right.
After a little practice in reading such diagrams, it is apparent at a glance that this is merely an abbreviation for the following three norms:

\[
\begin{align*}
(1) & \quad C^1 \quad C_2 \quad C_5 \rightarrow NL_1 \\
(2) & \quad C^1 \quad C_2 \quad NC_5, C_3, NC_4 \rightarrow L_2 \\
(3) & \quad C^1 \quad C_2 \quad NC_5, NC_3 \quad C_4 \rightarrow L_1
\end{align*}
\]

Such a reorganization of sentences is not usually achieved merely by normalizing these sentences, since the reorganization often is accompanied by radical changes of wording from the original text. The synthesis of several normalized versions and their formatted interpretations, however, will permit a relatively easy and speedy reorganization of sentences.

The value of reorganizing sentences and building an NSSA File is not limited, however, to information retrieval. In addition, such a file will provide the legislature with a more comprehensive image of the present state of legal affairs and will permit more comprehensive considerations of policy matters.

Finally, in analyzing legal literature for building an NSSA File, an analyst is likely to detect many otherwise undetected syntactic ambiguities, seemingly inappropriate word choices, and circularities.

For example, §11 of the Michigan Mental Health Law 1966 contains the following provision:

[1] If those persons legally liable under this act for the care and maintenance of such mentally diseased person have sufficient means for that purpose, the court shall order his admission as a full-pay patient, or partial-pay patient, to any hospital . . . , and shall specify the amount which the estate of such mentally diseased person, or those persons personally liable for the care and maintenance of such mentally diseased person shall pay for care
and maintenance of such mentally diseased person in such state institution. . . . The patient or his estate, children of over 21 years of age, spouse and the natural parents or legal adoptive parents of a child, being of sufficient ability, shall jointly and severally be liable for the care and maintenance of any patient.

The syntactic relationships among various parts of this provision may be clarified by expressing the provision in normalized form as follows:

If
1/ a. persons are members of the following class: the patient or his estate, children of over 21 years of age, spouse and the natural parents or legal adoptive parents of a child, and
b. the persons are of sufficient ability,
then
2/ a. those persons shall be jointly and severally liable for the care and maintenance of the patient, and
b. if
1/ persons legally liable under this act for the care and maintenance of such mentally diseased person have sufficient means for that purpose,
then
2/ a. the court shall order his admission as a full-pay patient, or partial-pay patient, to any hospital . . . , and
b. the court shall specify the amount which the estate of such mentally diseased person, or those persons personally liable for the care and maintenance of such mentally diseased person in such state institution . . . .

As is clear from this interpretation, (a) being members of a certain class, and (b) being of sufficient ability are conditions for joint and several liability, while those two conditions and (c) having sufficient means for the purpose are conditions empowering the court to specify the amount of liability. The relationship between conditions (b) and (c) is that the former condition determines the boundary between the existence and non-existence of liability, while the latter condition determines the degree of liability when the existence of liability is
determined. Non-existence of liability, however, can be considered to be the zero degree of liability, and the above mentioned set of ideas can be expressed without using condition (b) as follows:

If

1. a. persons are members of the following class: the patient or his estate, children of over 21 years of age, spouse and the natural parents or legal adoptive parents of a child, and
  b. persons have sufficient means for the care and maintenance of such mentally diseased person,

then

2. a. those persons shall be jointly and severally liable for the care and maintenance of the patient, and
  b. the court shall order his admission as a full-pay patient, or partial-pay patient, to any hospital... and
  c. the court shall specify the amount which the estate of such mentally diseased person, or those persons personally liable for the care and maintenance of such mentally diseased person in such state institution...

Consider another example this time from § 2056(c) of the Internal Revenue Code. A part of the normalized version of § 2056(c)(2)(B) will be as follows:

If

(16d) in case of the death of the decedent at such moment such property (and not merely one-half thereof) would be or would have been includible in determining the value of his gross estate without regard to the provisions of section 402 (b) of the Revenue Act of 1942.

then

(16n) for purposes of clauses (i), (ii), and (iii), community property (except property which is considered as community property solely by reason of the provisions of subparagraph (C) of this paragraph) shall be considered as not "held as such community property" as of any moment of time.
In addition, a part of the normalized version of Sec. 2056(c)(2)(C) will be:

\[17d\]
\[
A \quad (17n) \text{If} \\
\quad \quad 1/ \text{after December 31, 1941, property held as such community property (unless considered by reason of subparagraph (B) of this paragraph as not so held) was by the decedent and the surviving spouse converted, by one transaction or a series of transactions, into separate property of the decedent and his spouse (including any form of co-ownership by them), then}
\quad 
\quad 2/ \text{the separate property so acquired by the decedent and any property acquired at any time by the decedent in exchange therefore (by one exchange or a series of exchanges) shall, for the purposes of clauses (i), (ii), and (iii) of subparagraph (B), be considered as "held as such community property."}
\]

Part of the interpretation of 16B will be:

\[16B^*\]
\[
B \quad (16n) \text{If} \\
\quad \quad (1) \text{for purposes of clauses (i), (ii), and (iii), community property (except property which is considered community property solely by reasons of the provisions of subparagraph (C) of this paragraph) shall be considered as not "held as such community property" as of any moment in time,}
\]
then

\begin{enumerate}
\item if
\begin{enumerate}
\item property is a community property, and
\item it is not so that it is considered as community property solely by reason of the provisions of subparagraph (C),
\end{enumerate}
\end{enumerate}

\begin{enumerate}
\item for purposes of clauses (i), (ii), and (iii) the property shall be considered as not "held as such community property" as of any moment of time.
\end{enumerate}
These provisions intend to define under certain conditions the term "held as such community property," but its definition is clearly circular. In order to eliminate certain property from "as such community property" by (c)(2)(B), that property must fulfill the condition 16B2. In order to decide whether certain property fulfills the condition 16B2, however, it has to be decided whether this property fulfills the condition 17A1. This condition, however, presupposes a decision on whether the property is eliminated from "as such community property" by (c)(2)(B). If cast into normalized form at the drafting stage, such circularity in legislation would be more apparent and perhaps omitted.

These examples demonstrate that the above-explained technique serves to detect the inadequacies of a statute. Thus if a draftsman analyzes his tentative draft by this technique, his capacity to produce a precise draft will be much enhanced.

What the total effects of improving the communication networks involving legal literature by building NSSA Files is likely to be remains somewhat conjectural at this stage of developing such files. But there can be no doubt that organizing the legal storehouse of knowledge in a way that permits more extensive use of computers in the man-machine communications mix and permits enhancement of the policy-making role of legislative institutions relative to judicial institutions has potentials for profoundly influencing law and its role in modern society.