# Model Based User Interface Constructor with Consistency Checking

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The aim of this paper is to introduce the progress made by the authors in the development of a methodology for modelling the dependencies among data entries in a dialog box and design of a software tool supporting the user interface programming. An object oriented dialog box model and an event driven user interface architecture are analysed. The principal features of the user interface constructor consisting of a graphical user interface model editor and source code generator are introduced. The formal analysis of dependence among dialog entries [3] is utilised
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## 1. Introduction

As contrast to well developed data modelling theory (relational algebra, object-oriented data models, ...) the attempts of formal user interface modelling are rare [3,4]. The experience says that the quality of the user interface is one of the most important conditions for success of the particular software application. User interface programming as a part of software developer's activities represents very complicated and tedious work. Those are reasons for development of means which would support the process of user interface design and programming.

Many commercially available programming environments equipped with an interactive user interface design facility already exist. These facilities usually make it possible to design the geometric layout of the data entries on the screen and to specify the validity conditions for particular data entries (e.g. FoxPro's Screen Builder). However, they do not usually take into account the mutual dependencies of several entries. In more complicated user interfaces, the mutual dependencies among entries represent the most difficult part of the programmer's work. Our aim is to describe these mutual dependencies by a model or, more precisely, to design a

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formalism capable to express mutual dependencies among entries of a general user interface dialog.

The model specifies also events which can arise  in the course of the interactive entering  data into the dialog box by the user.

Having such a model and the model based user interface constructor the user will interactively define code snippets (chunks of code) for handling particular events to achieve the required behaviour of the user interface. In the course of  code generation these code snippets will be bind by the MBUIC into resulting source code.

## 2. Motivation

Fig. 1 represents schematically an example dialog box of a hypothetical information system on telecommunication lines. The dialog consist of a push button *ACCEPT* and five dialog entries *Line Ident*, *Transmission Means, Quality* and *Transmission Speed.*

The *Line Ident* entry identifies uniquely the particular telecommunication line. The other entries define the parameters of the line. These four lines are mutually dependent in the sense that not all combinations of their values are allowed.

Let the *Type* entry can have one of the values **RP** (line for transmission of radio programme) or **DP** (data transmission). The *Transmission Means* entry can be either **TF** (telephone equipment) or **TG** (telegraph equipment). The *Quality* entry can have the value of **T**, **A** or **Q** and defines the width of the frequency band. The meaning of the *Transmission Speed* entry is clear.

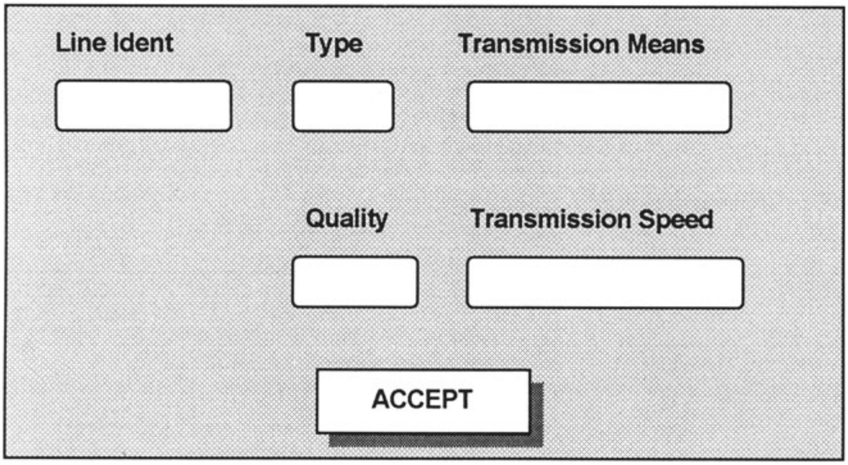

Fig. 1