

## HappyKids

HappyKids is a daycare center in Newark, DE owned by Misty Gerard (M.G.). While business is great (there are more than 100 kids on the waiting list right now), Misty is a little concerned. The current information system (IS) doesn't function really well and she does not really have the data she needs: knowing where the children are, what activities are taking place, which parents have paid, etc. She desperately needs a new, world class, IS that helps her to generate such information. Misty contacts ACCT-302, a local company specialized in designing enterprise systems. The first thing ACCT-302 asks Misty is to explain how her business works and what data she needs. Here is the transcript of the interview.

**ACCT-302.** I guess that it is all about the children? What do you want to know about the children?

**M.G.** Absolutely! It is all about the children (we call them kids most of the time). We record a child's name, immunization list, food allergies, etc. We also need to record information regarding the adults who are responsible for the children. The IS needs to record the following information regarding adults:

1. At least one parent needs to be recorded for each kid. For most kids, we record two parents. Several parents have more than one child at HappyKids; we currently have a set of triplets in our daycare.
2. For security purposes, we also record information for all other adults who are, in addition to the parents, authorized to pick up a child. Not all children have authorized adults that can pick them up. At most five authorized adults can be recorded for a child. Some adults are authorized to pick up more than one child – e.g., the person who is authorized to pick up the triplets.

It should be noticed that, while rare, we have some parents that are also authorized to pick up children of whom they are not parents. However, most adults in our system are either “parents” or “authorized” but not both.

**ACCT-302.** What else do you want to know about the children?

**M.G.** We want to record explicitly whether kids are siblings. One could argue that such information is derivable from the parents information but we really want to record it explicitly. Most kids do not have siblings in our daycare. However, some kids have multiple siblings in our daycare. This is for example the case for the triplets I mentioned earlier.

**ACCT-302.** What about the waiting list?

**M.G.** We record children on the waiting list in our system. However, such children cannot be registered yet for a program. As a result, they cannot participate in any of our activities. We actually record a child's current status: (1) on the waiting list [WA], (2) active [A], (3) withdrawal [WD], or (4) rejected [R].

**ACCT-302.** What do you mean by program?

**M.G.** I probably should talk about our activities first. Activity information describes what a child is doing, where, when, and under whose supervision. The nature of an activity is determined by its activity type. The following are some examples of activity types: eating, reading, sleeping, watching TV, puzzles, games, gardening, etc. We have a predefined list of activity types that we update three times a year. While gardening is on our (activity type) list we actually never had a gardening activity (and no gardening activity has been scheduled yet). We have at least a few gaming activities (activity type = games) every day. We record exactly one activity type for each

activity. Between five and thirteen kids usually participate in an activity. It is impossible to have an activity without children. Each activity is supervised by at least one employee. Low intensity activities such as sleeping usually don't require assistants. However, high intensity activities such as games need several assistances. An employee can be the supervisor for one activity and an assistant for another activity. Employees need to go through training before they can participate in an activity (as supervisor or assistant). We record employee information before they start training. Jimmy, one of our employees, is an assistant for two activities this morning and a supervisor for two activities this afternoon. Each activity has a start time and an end time (when). An activity always takes place in exactly one location (where); e.g. playground C, the music room, etc. Last week, our new playground (playground D) was ready. We entered this new location into our system yesterday. No activities have taken place in playground D yet. We have 5 activities scheduled for the music room this week. All toddlers will participate in eating, gaming, and sleeping activities this morning.

**ACCT-302.** Well, you have explained activities now but you haven't said anything about programs yet.

**M.G.** Parents sign their children up for a (weekly) program (this is called a registration). We offer four different programs every week – one for each age group. A program is more like a schedule that describes what activity types are scheduled and how much time (expressed in minutes) will be spent on each activity type. For example, next week's program for toddlers has 300 minutes of sleeping (one hour a day), 240 minutes of watching TV (2 movies), 600 minutes of gaming activities, etc. Next week's program for infants has 1200 minutes of sleeping (four hours a day), 600 minutes of gaming activities, etc. There are at least five different activity types for each program. Further, we create and enter a program one week ahead; e.g. on Monday we entered next week's program in our system. Once a program is recorded into our system, parents can register their children for it. In most case, we get our first registrations two days after we have posted/recorded our program (i.e. on Wednesdays). We usually have close to twenty registrations per program (the maximum number of children allowed). A child must be specified for all registrations. A separate registration is required for each child. So, parents with multiple children at HappyKids (such as the triplet's parents) need to register each of their kids separately for a program. There is exactly one program per registration. Most children stay with us for years and thus need many registrations.

**ACCT-302.** How do you create programs?

**M.G.** We create four separate programs each week; one program for each age group or child type. We distinguish between four different child types: infant (I), toddler (T), preschooler (P), and school aged (SA). We record exactly one child type for each program. It should be impossible to record a child type without recording a program for it; i.e., a child type cannot exist without a program. We record a child's current child type and we do that for all children. We currently have 25 infants. It should be impossible to record a child type if we don't have at least one child of that type. We further record what activity types are allowed for each child type (or age group). We have numerous permissible activity types for each child type. All children (infants, toddlers, preschoolers, and school aged children) are allowed to sleep and eat (activity types). We haven't decided yet who (which age group) can do gardening (activity type) activities.

**ACCT-302.** What else do you want to know about programs?

**M.G.** Obviously, it is important to link the actual activities to their program. Each activity is assigned to exactly one program.

**ACCT-302.** What about collecting money?

**M.G.** Good question. We charge parents on a weekly basis (and thus per registration) Parents need to pay two days before the program starts. So parents can register on Wednesday and pay on Friday. Parents with more than one child at HappyKids can pay for multiple registrations at the same time. We don't accept installments; all registrations need to be paid in full. We have other sources of income than payments of parents for registrations (e.g. donations) that we would like to record into our system.

### Assignment

- Draw an E-R diagram: entities, relationships, relationship attributes, and cardinalities.
- You **don't** have to model the entity attributes.
- You **don't** have to define the relational database structure.

### Attributes

Child-name	Location-code	Employee-name
Adult-name	Adult-phone	Child-status
ChildType-code	Location-name	ActivityType-#
ActivityType-Program-minutes	Location-description	Employee-code
Activity-code	Activity-description	Program-code
Registration-date	Child-allergies	Activity-start-time
ChildType-name	ActivityType-description	Activity-end-time
Child-immunization-list	Adult-address	Employee-certifications
CashReceipt-rano	ActivityType-name	Adult-code
ChildType-description	Registration-#	Program-week
CashReceipt-date	CashReceipt-amount	Program-cost