

Teaching Case

American Association of University Women: Branch Operations Data Modeling Case

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ABSTRACT

A nationally prominent woman's advocacy organization is featured in this case study. The scenario may be used as a teaching case, an assignment, or a project in systems analysis and design as well as database design classes. Students are required to document the system operations and requirements, apply logical data modeling concepts, and design an appropriate data structure for a relational database. The case focuses on a membership administration system with several extended components to keep track of entities such as the Board of Directors and branch committees. The case has been used successfully in the classroom at both individual and group levels. Feedback from students and instructors who have utilized the case indicate that it is an effective instrument that provides a realistic illustration of real-world data modeling without being unreasonably complex. Teaching notes and a suggested solution including data flow diagrams, an entity-relationship diagram (ERD), and a data dictionary are available through the JISE web site.

Keywords: Systems analysis and design, Database design & development, Entity-relationship modeling/diagram, Data flow diagram, Teaching case

1. INTRODUCTION

AAUW is a non-profit group that promotes educational and equity issues for women and girls. In 1881, Marion Talbot and Ellen Swallow Richards invited 15 woman alumnae representing eight different colleges to join them at an assemblage in Boston, Massachusetts ("AAUW: Who We Are," 2015). The purpose of this meeting was to found an organization for women college graduates to foster opportunities for other women to attend college. Since this initial gathering, AAUW has grown to the point that AAUW has branches in all 50 states plus the District of Columbia, Guam and Puerto Rico. AAUW members advocate educational, social, economic, and political positions that benefit women. For example, AAUW was instrumental in the passage of Title IX that bans sex discrimination in any federally funded education program including collegiate athletics. There are approximately 170,000 active members

who are affiliated through approximately 1,000 local branches throughout the United States and its territories ("AAUW: Membership," 2015).

2. BACKGROUND

Students should assume the role of a system analyst responsible for designing an integrated data structure that meets the operating requirements of the local branches of the American Association of University Women (AAUW). Specifically, the outcome of this assignment would be an efficient relational data model for a database that may be used to support current and future branch operations. This data model should accommodate the requirements as indicated below.

3. CASE TEXT

3.1 Overview of AAUW Branch Operations

AAUW members typically join a local branch that has an affiliation agreement with the National Office. Membership dues are collected for three organizations – the local branch, the state branch (if one exists), and the National Office. The National Office, located in Washington D. C., has a staff of approximately 60 employees. The state level AAUW organizations, when they exist, are much smaller and may have a few employees. The local branches, by contrast, are all administered by unpaid volunteers. The National Office has IT professionals on staff and has developed application software for national operations. Software used at the local branch for managing operations varies dramatically depending upon the IT sophistication of the volunteer members of that branch. Some branches use combinations of Microsoft Word and/or Excel and in rare cases FileMaker to manage membership, mailings, and other tasks. Some branches have created databases using Microsoft Access or other database management tools. Other branches have members skilled in IT and have written sophisticated application software for branch operation management.

The National Office would like to develop a standard Branch Operation Management System that would be made available to any branch wishing to upgrade its IT application and install the new system. The decision to implement this new system would be totally at the discretion of the Boards of the local branches and would be provided at no cost to the branch. In addition to making the management of branch operations simpler and easier, the new system will also greatly automate, expedite, and enhance the data exchange between the local branches and the National and State Offices.

3.2 Establishing a Branch Board of Directors

Any group of women college graduates (minimally 3 to 5 individuals) in a community who wish to become an official AAUW branch must first form a Board of Directors (“AAUW Branch Creation Guide,” 2015). The Board must consist of at least two positions: Branch President and Branch Finance Chair. The President is responsible for developing, implementing and overseeing activities at that branch and in that locale. The President is usually the liaison between the Branch and the State and National AAUW offices. The President or her designee is expected to attend the AAUW National Convention which meets once a year.

The Branch Finance Chair (Treasurer) oversees the fiscal and financial operations of the branch. After the branch is certified by the State and National Offices, this person will open and maintain necessary bank accounts, prepare monthly and annual financial status reports, record all dues and contribution receipts, and pay approved invoices. The Branch Financial Chair is also responsible for filing IRS Form 990 annually.

Most branches usually staff several other chair positions often including: Secretary, Programs, Membership, Public Policy, Communications, Diversity, Newsletter Editor, and others. By June 7th of each year each branch is required to submit a completed copy of the AAUW Branch Officers Form (see [www.aauw.org/resource/member-state-and-](http://www.aauw.org/resource/member-state-and-branch-forms/)

[branch-forms/](http://www.aauw.org/resource/member-state-and-branch-forms/) for sample form) that details the positions on the board and the Member ID, name, address, email and phone of each person occupying a position on the Board for the coming year. In some cases there are co-chairs for positions where multiple people (usually two) share responsibility as a Board Chair.

The new system must maintain information on past and current Board position assignments: the position held plus the commencement and termination date of the officer’s assignment. Board posts are usually for one year duration but sometimes officeholders resign a position due to professional or personal reasons which necessitates that another member completes her term. Any local Board changes will be communicated to the State and National Offices when they happen. The system will be utilized to email members of the Board to announce meeting dates and other pertinent information.

3.3. Launching a New Branch

Once the initial Branch Board is specified and a Branch Name selected, the next step in launching a new branch is to obtain approval of the State Board, if one exists (“AAUW Branch Creation Guide,” 2015). Once the State Board Recommendation Form for Branches has been submitted and approved, a letter of recognition and certification is returned to the new branch. If no State Board exists, the prospective new branch contacts the National Office directly for approval.

The Branch President must sign and return within 30 days the Affiliate Agreement, which is the legal document binding AAUW and the branch that is required by the IRS (“AAUW Branch Creation Guide,” 2015). The AAUW and AAUW affiliated entities have tax-exempt nonprofit status and are designated as 501 (c)(3) charities and 501 (c)(4) social welfare organizations. Funds raised must go to support programs, activities, and services that are related to AAUW’s mission of supporting women’s issues. Once the AAUW Affiliate Agreement is executed by the new branch and approved by the National Office, the new local branch is official. At this time, the National Office assigns a Branch ID that is a 6-character ID with the first 2 characters being the postal States Code for that state and the next 4 characters being unique digits. For example, NY2057 is the Staten Island New York branch and NM8009 is the Grant County New Mexico branch.

Within 90 days, the new branch must obtain an Employer Identity Number (EIN) from the IRS that is required to open bank accounts.

The system will retain the Branch ID, Branch Name, City/Region, State, EIN, the date of branch certification, the branch’s current status and date of that status. The name of the Board member who is the official contact person for the Branch for communication between the Branch and the State and National Offices must be provided along with her address, phone and email. This contact person will usually change annually but the actual time an officer serves as the branch contact person may be longer or shorter than a year. A history of the contact persons and dates served will be maintained by the system. The National Office will periodically download the entire population of AAUW branches and their current Board members including contact

information to each branch to facilitate inter-branch communication and cooperation.

Sometimes branches disband or merge with other branches. They may also become inactive for a period of time and then later reactivate. The system will maintain a record of branch status history.

3.4. Membership

Once the local branch has been certified, it can then start to recruit and accept members. Membership is open to anyone holding an associate's (or equivalent, e.g. RN degree), bachelor's, or higher degree from a regionally accredited college or university ("AAUW Membership: How to Join," 2015). The system will capture the applicant's first, middle, and last name as well as their address, phone number and email. The National Office provides an electronic list of all accredited colleges in the United States along with the ID number of each institution. The applicant will also specify each degree and major earned at that institution and the year that it was awarded. The National Office provides a table of degrees and a table of majors that list each degree/major and a corresponding ID number for each. One applicant could have earned several degrees. For example, applicant's holding doctorate degrees typically also have a bachelor's degree and a master's degree. The status of the applicant will be set to regular active member when the application is received along with the dues payment.

The applicant is assigned a temporary MemberID by the branch system which is replaced by the permanent MemberID assigned by the National Office.

3.5. Dues

Membership dues for all three organizations (local branch and State and National Offices) are collected by the local branch at the time that an applicant joins. The fiscal year of AAUW runs from July 1st of a year through June 30th of the next year. Membership is effective for the fiscal year. Applications received between March 16th of any year and December 31st of that year must pay that fiscal year's dues. Applications received between January 1st and March 16th pay 50% of the full-year dues for a partial year membership.

A portion of the dues at each level is tax deductible. Currently, National dues are \$49 for regular annual membership with \$46 being tax deductible (501 (c)(3)) and \$3 being non-tax deductible because it is earmarked for lobbying activities (501 (c)(4)) (AAUW Resources: National Dues, 2015). The dues tax deductible amounts vary from branch-to-branch and from state-to-state. The dues rates (membership fees) at all three levels change over time. The new system will maintain a table containing the dues rates for that branch plus the rate for that state and the National Office and the date range over which those rates are in effect.

Other types of membership are available. A one-time payment (currently \$980 for National dues) entitles the applicant to Life Time Membership with no additional dues payments ever required. An Honorary Life membership is granted to individuals who have been members for over 50 years or in some cases to individuals who have provided extraordinary services to AAUW.

A member may hold dual memberships in two or more branches. The first branch joined collects local dues plus the

State and National Dues. Other branches only collect local dues for these dual members. Members often relocate and wish to transfer a membership to a different branch. The member transferring will be classified as a dual member of the new local branch for the remainder of that fiscal year. In subsequent year, the person's status will be changed to regular member and the new branch will collect local branch dues plus State and National dues.

3.6. Dues Receipts

On May 1st, the local branch mails an invoice to all their active dues paying members indicating what annual dues are owed for the next year with a breakdown of amounts by level (local, state, and national). The dues invoice also contains the total amount that is tax deductible as a charitable contribution. The member can use this document in conjunction with the cancelled check as documentation for a charitable contribution deduction on their tax return. A return envelope with the Finance Chair/Treasurer's or other designee's address is included with the invoice.

Members remit their payments by check only. These will be recorded in the new system. Dues payment checks are batched together and deposited in the bank account of the local branch on a weekly basis. Data captured by the system includes the check amount, date received, check number, deposit date and deposit number. Checks with an incorrect amount paid are returned to the member and a replacement check is usually issued by that member. On occasion checks are rejected by the bank, usually for insufficient funds. When the bank returns a member's check, the dues receipt entry is voided and the member notified.

Every two weeks until August 30th, reminder notices will be automatically emailed to members who have not paid their dues. On September 1st, the status of the non-paying individual is changed to Inactive. Dues receipts received late or new membership dues received later that year are processed using the same procedure.

All AAUW entities use a cash basis for accounting so only cash receipts and disbursements are recorded. The accounting software, if any, utilized will be determined at the branch level. Most branches use QuickBooks or Quicken but some perform all accounting procedures manually. The new system will produce monthly dues receipts posting files for recording dues receipts in the general ledger of the accounting system chosen. Branch expense payments and event expense reimbursements will be processed using the accounting software and are not part of the requirements of the new system. The local branch is required to issue checks to the State and National Offices for their share of dues collected within two weeks of receipt by the branch. This function will also be accomplished using the accounting system. Along with the check, the local branch provides a breakdown of each member and their payment amount. New members are identified by the National Office and their permanent Member ID's are assigned and communicated to the local branch.

3.7. Committees

There is typically a committee for each significant event or activity that the branch is planning such as educational programs, scholarship fund raising, and major social events.

Each committee has a chairperson or co-chairpersons. Some committees are large enough that other formal officer positions in addition to chairperson are assigned within that committee. Some committees are standing committees that renew every one or two years. Others are ad hoc committees that only exist for a short duration.

The new system will maintain the composition of the committees and any committee officeholders. Branch members may actively serve on several committees simultaneously. The system will be utilized to email members of committees to announce meeting dates and other pertinent information for that committee.

4. ASSIGNMENT

Various assignments may be developed based on the information provided in Section 3. Examples of the class activities and assignments are provided below.

Week	Classroom Lecture/Activity	Assignment (due next class)
0	Data flow diagram lecture ERD lecture	Read AAUW case
1	Debrief AAUW case Develop Initial system requirements	Data flow diagrams
2	Discuss Data flow diagram assignment Develop a list of entities for ERD	ERD Data Dictionary

Table 1. Suggested class activities and assignments

The DFDs submitted by students should demonstrate their ability to extract relevant data from the specifications provided in the case. The diagramming conventions followed must be consistent with Dennis, Wixom, and Roth (2011) or Hoffer, George, and Valacich (2013). Students must then create the associated list of entities and attributes showing relevant field names and keys consistent with ERD concepts presented in Kendall and Kendall (2013) or Hoffer, George, and Valacich (2013).

5. CONCLUSIONS

The American Association of University Women case has proved to be a comprehensive and effective instrument for teaching data modeling in systems analysis and design as well as database design and development classes.

The requirements articulated in the case are an accurate depiction of those encountered at local AAUW branches. To keep the case tractable, not all of the actual requirements were included. For example, the National AAUW also has a College/University Partners program where a collegiate institution can pay a fee and become a partner ("AAUW: College/University," 2015). Any interested coed at that school can then join the National AAUW as a student member for no additional cost. Each College/University Partner will also need software to manage their operations. The case also did not address fund raising activities performed at AAUW. In fact, the latest audited financial statement (fiscal year ending 6/30/2013) for the National

Office showed the Dues Revenue (\$3.1 million) was in fact greatly exceeded by Contribution Revenue (\$7.7 million).

The case can easily be expanded to include user input screen and report designs where students would develop screen and report layouts. It can also be adapted to cover top-down program design showing the tree structure of the various modular components using the functional decomposition of the data flow diagrams. A class discussion could include how these system components exchange data with minimal coupling and maximum cohesion. In addition, students could develop system hardware and software requirements that could be given to local branches that would like to implement this system.

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