GRADUANT POSTING DECISION SUPPORT SYSTEM (GPDSS): A DEFLATOR OF GODFATHERISM IN GRADUANTS’ POSTING FOR NYSC

1 Ajayi Olusola Olajide, 2 Ojeyinka Taiwo O, 3 Johnson Olarewaju Victor, 1 Isheyemi Olufemi Gabriel, 1 Lawal Muideen Adekunle, and 1 Adepoju Damilola Ifeoluwa
1 Department of Computer Science, Faculty of Science, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria
2 Department of Computer Science, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria

Corresponding Author: Ajayi Olusola Olajide

Abstract
The development of any decision support system (DSS) is complex. It depends on the task being supported and the organization that is going to use it including its present design practices. This research work critically analyses the nature and state of DSS in combating godfatherism in graduates’ posting. Graduate Posting Decision Support System (GPDSS) is a decision process that deals with posting of fresh graduate for National Youth Service Corp taking into cognizance the age, state of origin, and other logical parameters. The study demonstrates and agitates full deployment of DSS in reducing or eliminating godfatherism in the posting of fresh graduates for NYSC. To provide context for the study, a history of DSS is presented which focuses on the evolution of a number of sub-groupings of research and practice. Documents and sampled data of previous NYSC postings were taking from the Student Affairs arm of Adekunle Ajasin University, Akungba-Akoko, Ondo State. MySQL and PHP were used to design the system.

Keywords: decision support system, design, deploy, decision process, godfatherism

INTRODUCTION
The National Youth Service Corps (NYSC) is a scheme organized to have fresh Nigerian graduates passed through a one-year orientation and training programme. The scheme which was established in 1973 by the Federal Government of Nigeria, have "Corp" members posted to cities far from their city of origin. They are expected to mix with people of other tribes, social and family backgrounds, to learn the culture of the indigenes in the place they are posted to. This action is aimed to bring about unity in the country and to help youths appreciate other ethnic groups (Wikipedia).

Decision making is at the very centre of education management and administration, especially as it affects fresh graduate posting. Topping the list of the problems inherent on the existing system is the influence of godfatherism in the posting of graduate. While graduates from rich/influential homes are rejoicing of been posted to their desired/requested states of the federation, graduates from poor/non-influential homes are crying of been posted to undesirable places.

The discourse of godfatherism had so much influenced the socio-economic and political life of the nation especially in the fourth republic. It has become almost impossible for an individual to hold political office either by appointment or election without patronizing a godfather because of their power and influence. However, the insurgence of the Boko Haram and insecurity problem in the nation has attracted many which before now do not believe in godfatherism to embrace the gospel of godfatherism to secure a non-violence place for their wards.

MOTIVATION AND AIM OF THE STUDY
Indeed the NYSC posting system is a computerized one, but the level of problem highlighted above, shows that the process/ procedure of the system implementation still has some elements of human interference. The researcher is therefore prompted to develop a system that permits posting of graduates to be done solely by the machine depending on the parameters inputted. The proposed system (Graduant Posting Decision Support System (GPDSS)) would eliminate the influence of godfatherism in the course of posting fresh graduates.

METHODODOLOGY OF THE STUDY
Research methodology is crucial to system development process. In order to actualize the set goals of this study, adequate information were gathered, through interview, from the Student Affairs Unit of Adekunle Ajasin University – an arm responsible for liaising with NYSC. During the NYSC three (3) weeks orientation camp, sufficient information were also gathered, on personal ground, from some NYSC Officials, especially on the logic (parameters) used for allocating students to states. From the findings, it was revealed that, state of origin, state of residence (permanent address of residence), school state, and age of the students, are the major parameters used for querying the students data for allocation to their various computed states of the federation.

REVIEW OF RELATED LITERATURE
Decision Support
Information systems researchers and technologists have built and investigated computerized Decision Support Systems (DSS) for approximately 40 years. This article chronicles and explores the developments related to building and deploying DSS. The journey began with
building model-driven DSS in the late 1960s, theory developments in the 1970s, and implementation of financial planning systems, spreadsheet-based DSS and Group DSS in the early and mid-1980s.

Data warehouses, Executive Information Systems, OLAP and Business Intelligence evolved in the late 1980s and early 1990s. Finally, the chronicle ends with knowledge-driven DSS and the implementation of Web-based DSS beginning in the mid-1990s. The field of computerized decision support is expanding to use new technologies and to create new applications. Computerized decision support systems became practical with the development of minicomputers, timeshare operating systems and distributed computing. The history of the implementation of such systems begins in the mid-1960s. In a technology field as diverse as DSS, chronicling history is neither neat nor linear. Different people perceive the field of Decision Support Systems from various vantage points and report different accounts of what happened and what was important (Arnett&Pervan, 2005; Eom& Lee, 1990b; McCosh& Correa-Perez, 2006; Power, 2003; Power, 2004a; Silver, 1991). Today, one can organize the history of DSS into the five broad DSS categories explained in Power (2001; 2002; 2004b), including: communications-driven, data-driven, document driven, knowledge-driven and model-driven decision support system.

Decision support is the assistance provided to a decision maker in the form of technical expertise that enhances the decision making process. Decision support includes the following: decision analysis tools, application of decision support and decision support systems (DSS).

**Decision Analysis Tools**

A decision analysis tool consists of analysis software, computer simulation models, and scientific visualization tools. While some tools are used interchangeably in a DSS, others are used individually.

**Application of Decision Support**

DSSs and tools are being applied by the scientific community to meet a lot of problems facing decision makers. Decision support research addresses these challenges by enhancing the abilities of those individuals who are in a position to change, plan, and design the growth of their organizations.

**Decision Support System**

Decision Support System (DSS) is a class of computerized information systems that support decision-making activities. DSS is meant to aid a decision maker in manipulating data, solving semi-structured problems, and build and use mathematical models (Nakakawa). DSSs work by using models and algorithms from disciplines such as decision analysis, mathematical programming and optimisation, stochastic modelling, simulation, and logic modelling (Christopher, 2003).

Decision support systems are interactive, computer-based systems that aid users in judgment and choice activities. They provide data storage and retrieval but enhance the traditional information access and retrieval functions with support for model building and model-based reasoning. They support framing, modeling, and problem solving.

Typical application areas of DSSs are management and planning in business, health care, the military, and any area in which management will encounter complex decision situations. Decision support systems are typically used for strategic and tactical decisions faced by upper-level management decisions with a reasonably low frequency and high potential consequences in which the time taken for thinking through and modeling the problem pays off generously in the long run.

**There are three fundamental components of DSSs**

- **Database management system (DBMS).** A DBMS serves as a data bank for the DSS. It stores large quantities of data that are relevant to the class of problems for which the DSS has been designed and provides logical data structures (as opposed to the physical data structures) with which the users interact. A DBMS separates the users from the physical aspects of the database structure and processing. It is also capable of informing the user of the types of data that are available and how to gain access to them.

- **Model-base management system (MBMS).** The role of MBMS is analogous to that of a DBMS. Its primary function is providing independence between specific models that are used in a DSS from the applications that use them. The purpose of an MBMS is to transform data from the DBMS into information that is useful in decision making. Since many problems that the user of a DSS will cope with may be unstructured, the MBMS should also be capable of assisting the user in model building.

- **Dialog generation and management system (DGMS).** The main product of an interaction with a DSS is insight. As their users are often managers who are not computer-trained, DSSs need to be equipped with intuitive and easy-to-use interfaces. These interfaces aid in model building, but also in interaction with the model, such as gaining insight and recommendations from it. The primary responsibility of a DGMS is to enhance the ability of the system user to utilize and benefit from the DSS.

**BRIEF HISTORY OF DECISION SUPPORT SYSTEMS**

In the early 1960s, organizations were beginning to computerise many of the operational aspects of their business. Information systems were developed to perform such applications as order processing, billing, inventory control, payroll, and accounts payable. The goal of the first management information systems (MIS) was to make information in transaction processing systems available to management for decision-making purposes. Unfortunately, few MIS were successful (Ackoff, 1967; Tolliver, 1971). Perhaps the major factor in their failure was that the IT professionals of the time misunderstood the nature of managerial work. The systems they developed tended to be large and inflexible and while the reports generated from managers’ MIS were typically several dozen pages thick, unfortunately, they held little useful management information (Ackoff, 1967; Mintzberg, 1977).
The title of Dearden’s (1972) *Harvard Business Review* article, “MIS is a Mirage”, summarized the feelings of the time. The term “decision support systems” first appeared in a paper by Gorry and Scott Morton (1971), although Andrew McCosh attributes the birth date of the field to 1965, when Michael Scott Morton’s PhD topic, “Using a computer to support the decision-making of a manager” was accepted by the Harvard Business School (McCosh, 2004). Gorry and Scott Morton (1971) constructed a framework for improving management information systems using Anthony’s categories of managerial activity (Anthony, 1965) and Simon’s taxonomy of decision types (Simon, 1960/1977). Gorry and Scott Morton conceived DSS as systems that support any managerial activity in decisions that are semi-structured or unstructured. Keen and Scott Morton (1978) later narrowed the definition, or scope of practice, to semi-structured managerial decisions; a scope that survives to this day. The managerial nature of DSS was axiomatic in Gorry and Scott Morton (1971), and this was reinforced in the field’s four seminal books: Scott Morton (1971), McCosh and Scott Morton (1978), Keen and Scott Morton (1978), and Sprague and Carlson (1982).

Much of the early work on DSS was highly experimental, even radical (Alter, 1980; Keen and Gambino, 1983). The aim of early DSS developers was to create an environment in which the human decision maker and the IT-based system worked together in an interactive fashion to solve problems; the human dealing with the complex unstructured parts of the problem, the information system providing assistance by automating the structured elements of the decision situation. The emphasis of this process was not to provide the user with a polished application program that efficiently solved the target problem. In fact, the problems addressed are by definition impossible, or inappropriate, for an IT-based system to solve completely. Rather, the purpose of the development of a decision support system is an attempt to improve the effectiveness of the decision maker. In a real sense, DSS is a philosophy of information systems development and use and not a technology.

DSS is not a homogenous field. There are a number of fundamentally different approaches to DSS and each has had a period of popularity in both research and practice. Each of these “DSS types” represents a different philosophy of support, system scale, level of investment, and potential organisational impact. They can use quite different technologies and may support different managerial constituencies.

Another dimension to the evolution of DSS is improvement in technology, as the emergence of each of the DSS types has usually been associated with the deployment of new information technologies. It is clear that DSS belong to an environment with multidisciplinary foundations, including (but not exclusively) database research, artificial intelligence, human-computer interaction, simulation methods, software engineering, and telecommunications.

### Components of Decision Support Systems

All DSS have three major components, namely:

a) A data store of knowledge (knowledge base).

b) A process by which this knowledge may be systematically interrogated to provide answers to questions (inference engine).

c) A user interface providing users with an intuitive, accessible tool for gaining the information they require (user interface).

---

**TYPES OF DECISION SUPPORT SYSTEMS**

- A **model-driven DSS** emphasises access to and manipulation of a statistical, financial, optimisation, or simulation model. Model-driven DSS use data and parameters provided by users to assist decision makers in analysing a situation; they are not necessarily data-intensive.

- A **communication-driven DSS** supports more than one person working on a shared task; examples include integrated tools like Microsoft’s NetMeeting or Groove.

- A **data-driven DSS** or data-oriented DSS emphasises access to and manipulation of a time series of internal company data and, sometimes, external data.

- A **document-driven DSS** manages, retrieves, and manipulates unstructured information in a variety of electronic formats.

- A **knowledge-driven DSS** provides specialised problem-solving expertise stored as facts, rules, procedures, or in similar structures. It consists of if-then rules, a bunch of facts, and an interpreter controlling the application of the rules, given the facts.

### RELATED WORK

The aim of Siddiqa *et al* (2000) work was to develop an ICT tool to assist non-specialist biologist researcher users in performing analysis of large amount of data by applying simple simulation techniques. Problem: the shortcomings faced researchers for their analysis at present include lack of user-friendly interface, and learning complicated statistical tools for not only analyzing the data but also interpreting the data. Therefore, there is need to use tools which are more intuitive and user friendly, such as agent-based modeling simulation techniques.

The methodologies used are: (a) Data collection and conversion; data were collected from breast cancer
patient from two major onco-referral hospitals. (b) Data filtering fusion: the filtering and integration of data and knowledge collected from disparate sources by different methods into a consistent, accurate, and useful whole (c) System implementation: utilization of agent-based simulation models on the filtered data in order to order non-specialist end-users (biologists).

The results obtained shows that the standardized conversion process of data from medical practitioners to DSS end users. It also provides tools for easy analysis of data by trickling data down to results of queries.

Vinnik et al (2005) aim was to contribute to the next generation of academic DSS based on the Data Warehousing Technology with incorporated Data Mining and Knowledge Discovering functionalities. Problem: the researchers saw academic resource planning as a highly complex administrative procedure based on extensive analysis of the entire data related to educational framework. Unavailability of the data in the appropriate form and lack of tools and approaches for it evaluation prompted the move towards more systematic and efficient management of universities asset. The following methodologies were used: (a) Educational Capacity Analysis; it measures the available teaching capacities and describes the consumption of school’s academic services. (b) Model development; the researchers performed University Structure Modelling; the hierarchical structure consists of faculties, degrees and courses. (c) Model Implementation; the researchers chose a solution which is a database-enabled web-application since it best fulfils the requirements of a DSS with high availability and a differentiated multi-user access. The resulting system integrates data from heterogeneous University’s systems. Decision Support functionality is realized by offering reporting tools for solving particularly capacity-related tasks as well as by allowing users to navigate through the data and query it, generate interactive visualizations and explore those for retrieving interesting details. The future work of the researchers will be directed towards improving the data integration routines and enhancing the user interface to enable intuitive and interactive visual exploration of accumulated data with incorporated data mining techniques for expert trend analysis.

Mbilinyi et al (2005) aimed at developing a GIS-Based DSS that use remote sensing (RW), limited field survey and GIS to identify potential sites for rainwater harvesting (RWH) technologies. The problem the researchers wanted to solve is how maximize the water availability and land productivity in the semi-arid areas, since the necessary biophysical data and infrastructure are often lacking. The researchers used the following methodologies: (a) data collection; data about soil texture, soil depth, topography etc. were collected from two villages in Tanzania, (b) data processing and analysis; data obtained were processed in a GIS environment to produce contour map and to construct digital elevation map (DEM), (c) testing and validation of the DSS; testing aimed at checking the quality suitability and reliability of the system. Validation was done to prove the validity of the system. The outcomes the study demonstrated the capabilities of RS, GIS and field of data for identifying potential sites for RWH technologies that may be used for development and management of RWH programmes. The application of the developed DSS shows that it works efficiently to identify potential sites for RWH technologies in semi-arid areas. To increase its usefulness, more works can be carried out to refine the model and to include other ancillary data.

Nakakawa’s(2006) aim was to develop a Spatial Decision Support Tool for landfill site selection for municipal solid waste for Kampala and neighbouring districts in order to improve waste disposal crisis in these districts. Problem: effective management of solid waste was a major problem in the Kampala. The situation may be due to several factors, including a poorly managed and uncoordinated approach to waste management practice and landfill. There exist mostly dump sites, which are poorly sited and lack of management to ensure proper operation.

The following are the methods the researcher used:
(1) Identification of parameters (geographical and social parameters) that decision makers considers when locating landfill sites and collection of dataset
(2) Architecture design for the Spatial Decision Support Tool
(3) Development of a computer-based prototype Spatial Decision Support Tool for identifying and selecting a suitable landfill sites
(4) Tool evaluation –adjustment of weights assigned to parameters was done.

Results indicated the system provides the functionality of selecting features from GIS database, which was use to select only potential landfill sites from the entire overlay map. The limitation of the tool is as follows: (a) ground water level was not included in the tool (b) it does not contain digital map of the entire country (c) further research can be done to incorporate the opinions of other stakeholders.

SYSTEM MODELS AND ANALYSIS
The Proposed Model
System modeling is the process of developing abstract models of a system, with each model presenting a different view or perspective of that system. System modeling means representing the system using some kind of graphical notation, which is now almost always based on notations in the Unified Modeling Language (UML).

There are different types of modeling; of which a graphical modeling language such as Unified Modeling Language (UML) helps in developing, understanding, and communicating the different views.

The different types of modeling are:
- Use Case Modeling: - the functional requirements of the system are defined in terms of use cases and actors.
- Static Modeling: - This provides a structural view of the system.
Classes Modeling: These are defined in terms of their attributes, as well as their relationships with other classes. Dynamic modeling provides a behavioral view of the system.

The use cases are realized to show the interaction among participating objects. Object interaction diagrams are developed to show how objects communicate with each other to realize the use case. The state-dependent aspects of the system are defined with state charts. This study is modeled using combination of different types of model that best suit the concept.

**Problem Description**

**Contextual Model**

Fig 2.0: Shows the Contextual Model of the GPDSS  
Source: Author

**Use Case Model**

Fig 3.0 Illustrates Use-case model of GPDSS  
Source: Author

Graduant Posting Decision Support System (GPDSS) is a system that helps in decision making as it relates to posting of graduates for NYSC. NYSC is the statutory agency responsible for posting fresh graduates. The school sends Graduant details/data to NYSC, then certain criteria such as age of graduant, are employed to compute graduant for eligibility or exemption from service.

If graduant is eligible or qualified for service, another criterion such as the State of Origin of the Graduant, the State of Birth, and the State where the institution is sited, is taken into consideration; as it is expected that, no student should serve in his/her state of origin.
Process Model

![Process Diagram]

Fig 4: Process Model of the GPDSS
Source: Author

![Flowchart Diagram]

Fig 5.0: NYSC Admin Process/Data Model
Source: Author

The implementation
The system was implemented using MySQL 5.0 as the backend database and PHP 5.3.1 as the scripting language. The posting parameters were used as the rule-based parameters to determine the posting of each graduant. The system was fed with valid and invalid data to test its robustness. Below are the captures of some of the interfaces.
CONCLUSION AND RECOMMENDATION
Decision support system as it sounds ‘support’, is not a system that totally eliminates human intervention but supports actualization of systemic process. In other words, graduant posting decision support system may not totally eliminate the influence of humans/godfatherism in NYSC posting. However, in a nation/system where equality is preached, a system like decision support, should be allowed thrive. The youths are undoubtedly the leaders of tomorrow, influencing their NYSC posting today under any circumstances, will only mean training them to be leaders that who have instinct for influencing processes.

FUTURE RESEARCH DIRECTION
This study has been able to justify the need to deploy and enable decision support system in NYSC posting of graduants. However, in the nearest future, the researcher intends designing a system that enables intra-communication between tertiary institutions and NYSC as it relates to result dispatch for posting. The risk involved in transporting personnel and graduants’ results also calls for concern.

REFERENCES


