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A Preliminary System Dynamics Model of Intergovernmental Collaboration.

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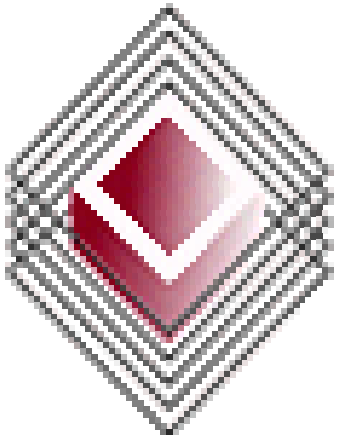

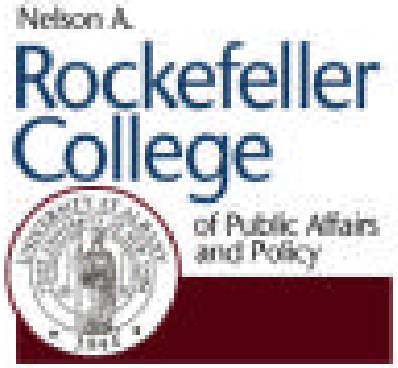

Background to the Model Building Project

- The activities of the project are being conducted as part of the ***Knowledge Networking in the Public Sector*** project at the The Center for Technology in Government and the work of the System Dynamics Group of the University at Albany.
- The project is supported in part by the National Science Foundation as part of the ***Knowledge and Distributed Intelligence*** program (National Science Foundation grant #SES-9979839)

Research Questions

The **Knowledge Networking in the Public Sector** project seeks answers to the research questions:

1. What are the defining characteristics of successful knowledge networks in the public sector?
2. What activities comprise the processes of planning and implementing these networks?
3. What organizational, technological, and political factors influence public sector knowledge networks and how can they be measured?

Background to the Model Building Project

- Answering the first research question the issue of collaboration was addressed as crucial and a dynamic theory was developed with the use of system dynamics.
- The theory was built around a specific case of the project. The case used was developed with the Bureau of Housing Services (BHS) of New York State related to the creation of the Homeless Information Management System (HIMS)

Specific Case to be Modeled

- The aim was to devise an integrated system that would help Government and nonprofit organizations better manage homeless services and evaluate their effectiveness. The outcome of the project will be the creation of the Homeless Information Management System (HIMS).

Group Model Building

- System dynamics methods were used to develop a dynamic theory of collaboration, with a group model building approach.
- To build the model a team of ten people was put together, four modelers and five staff members from CTG.

Group Model Building

- The group model building session followed the scripts for modeling as described by Andersen and Richardson (1997)**.
- The total time spent in the group process was two half-day sessions. (Cresswell, et al (2001)*, www.albany.edu/cpr/sdgroup/HIMS)

*Cresswell, Anthony, et al "Group Modeling of IT-Based Innovations in the Public Sector", *Proceedings of the 2001 System Dynamics Research Conference*, Atlanta GA: System Dynamics Society, Albany, NY, 2001.

**Andersen, D. F. and G. P. Richardson (1997). "Scripts for Group Model Building." System Dynamics Review 13(2): 107-129.

Modelling Group

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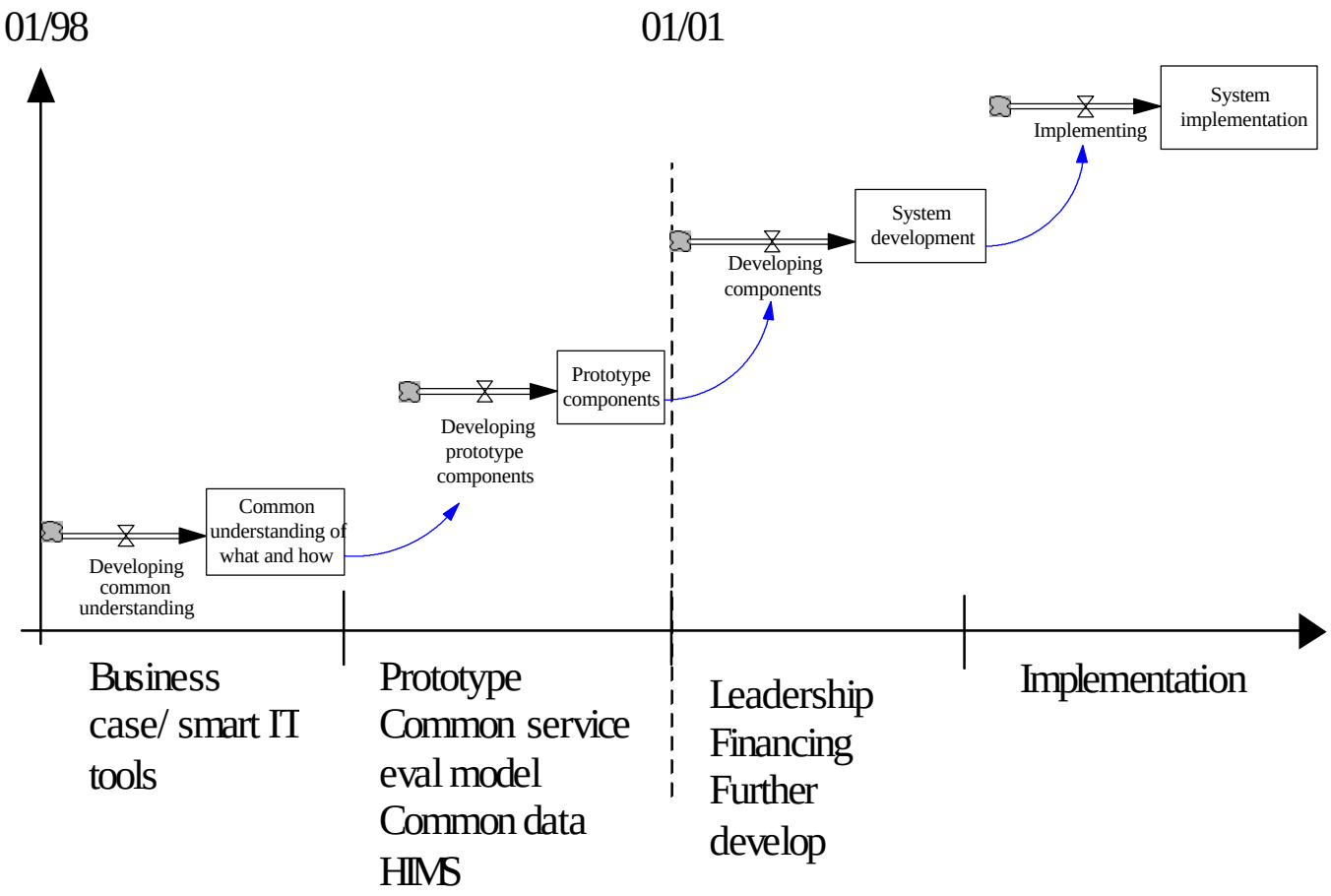
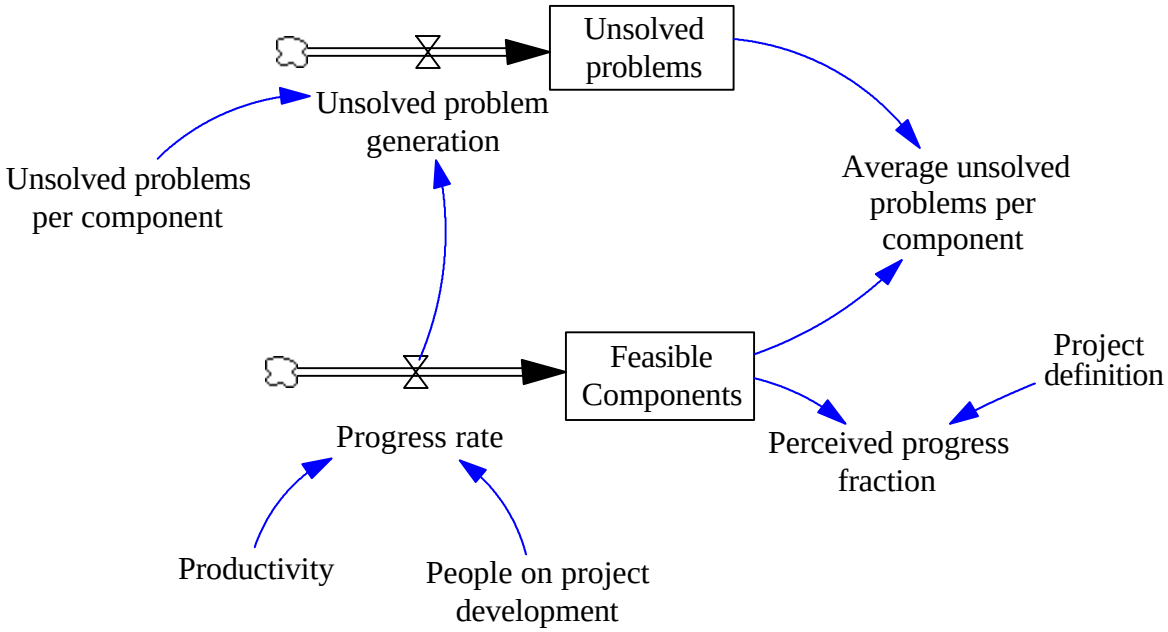
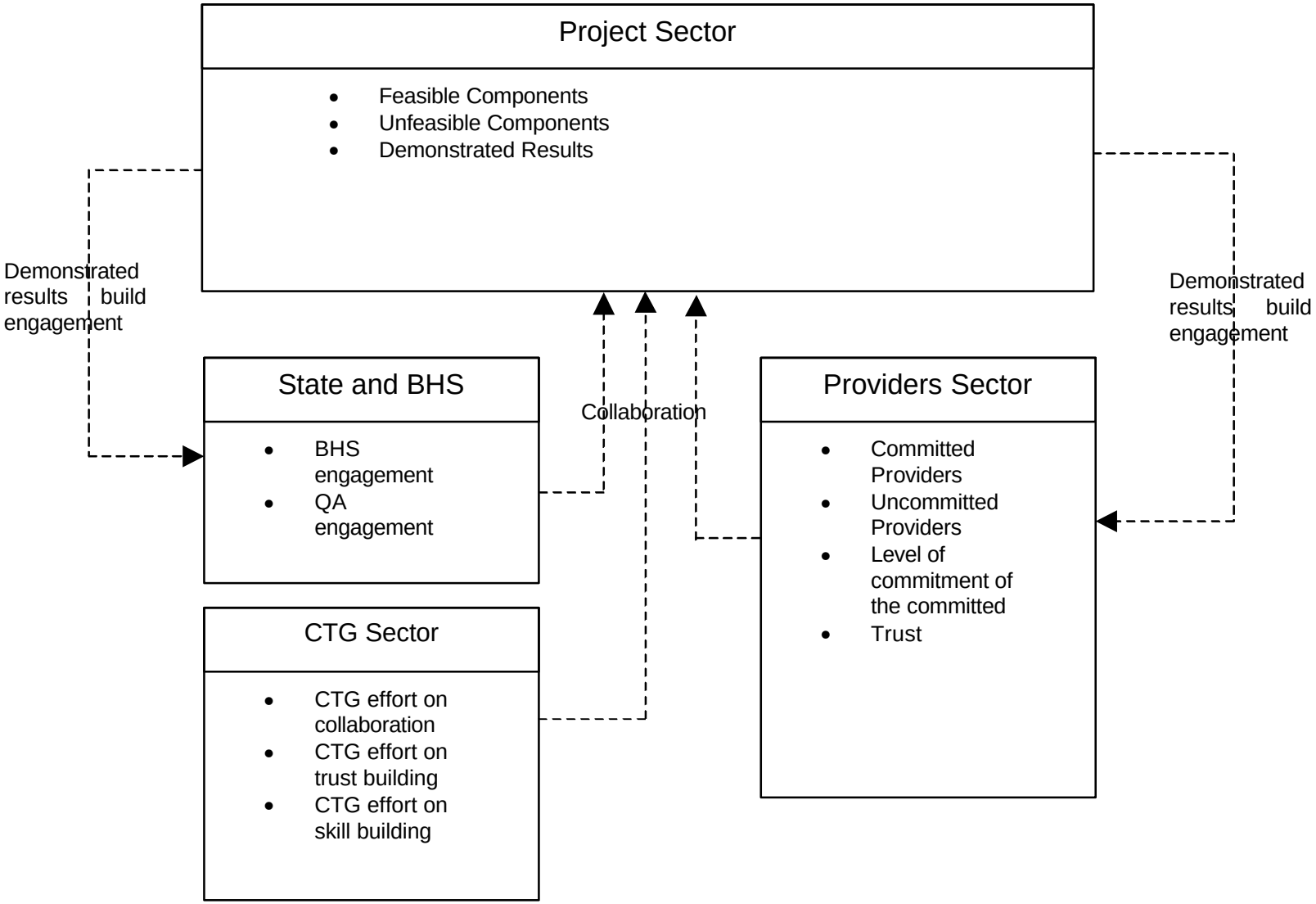
Multi-stage process



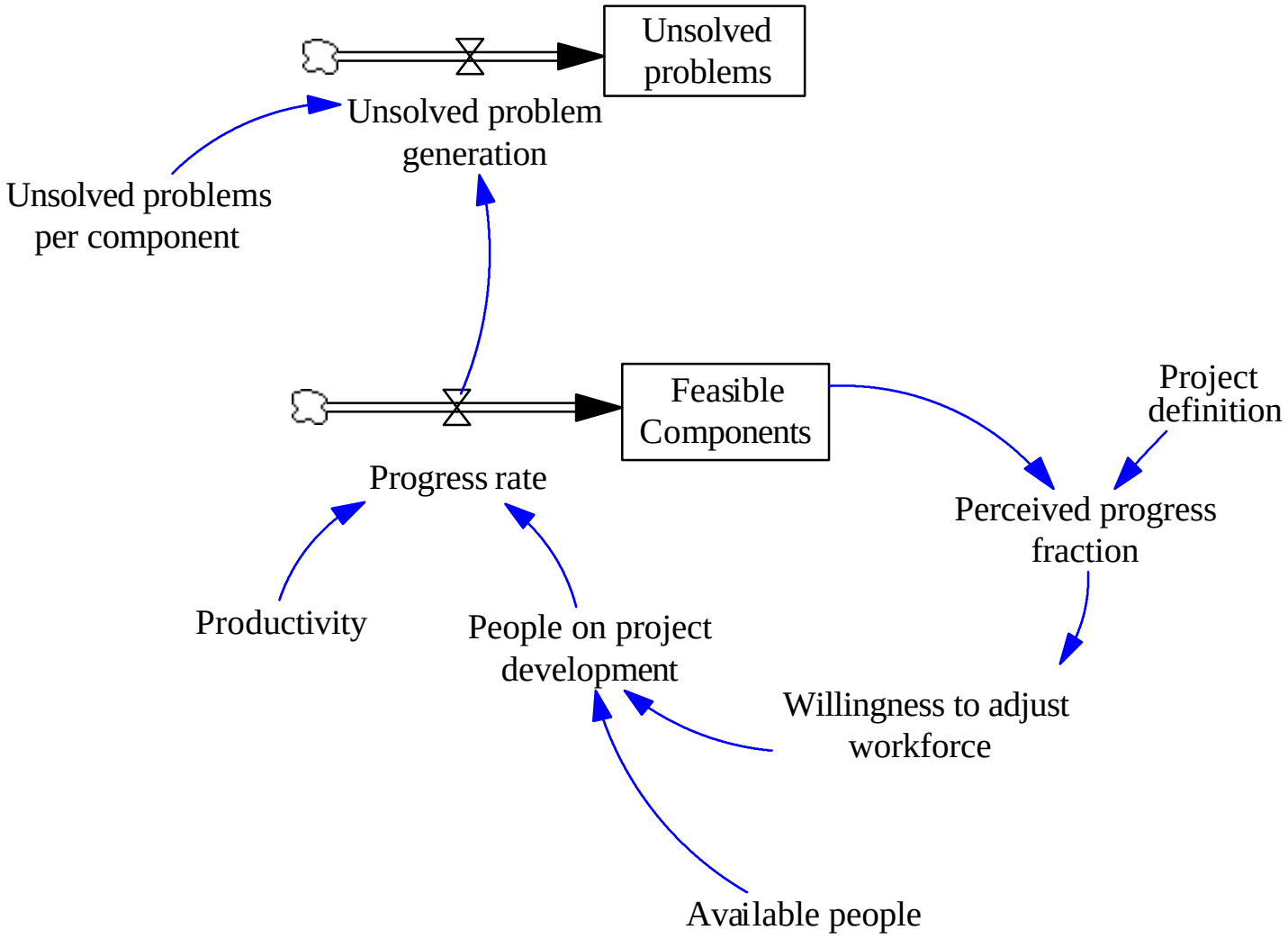
Single-stage process



Model Sectors (*TRUST1*)

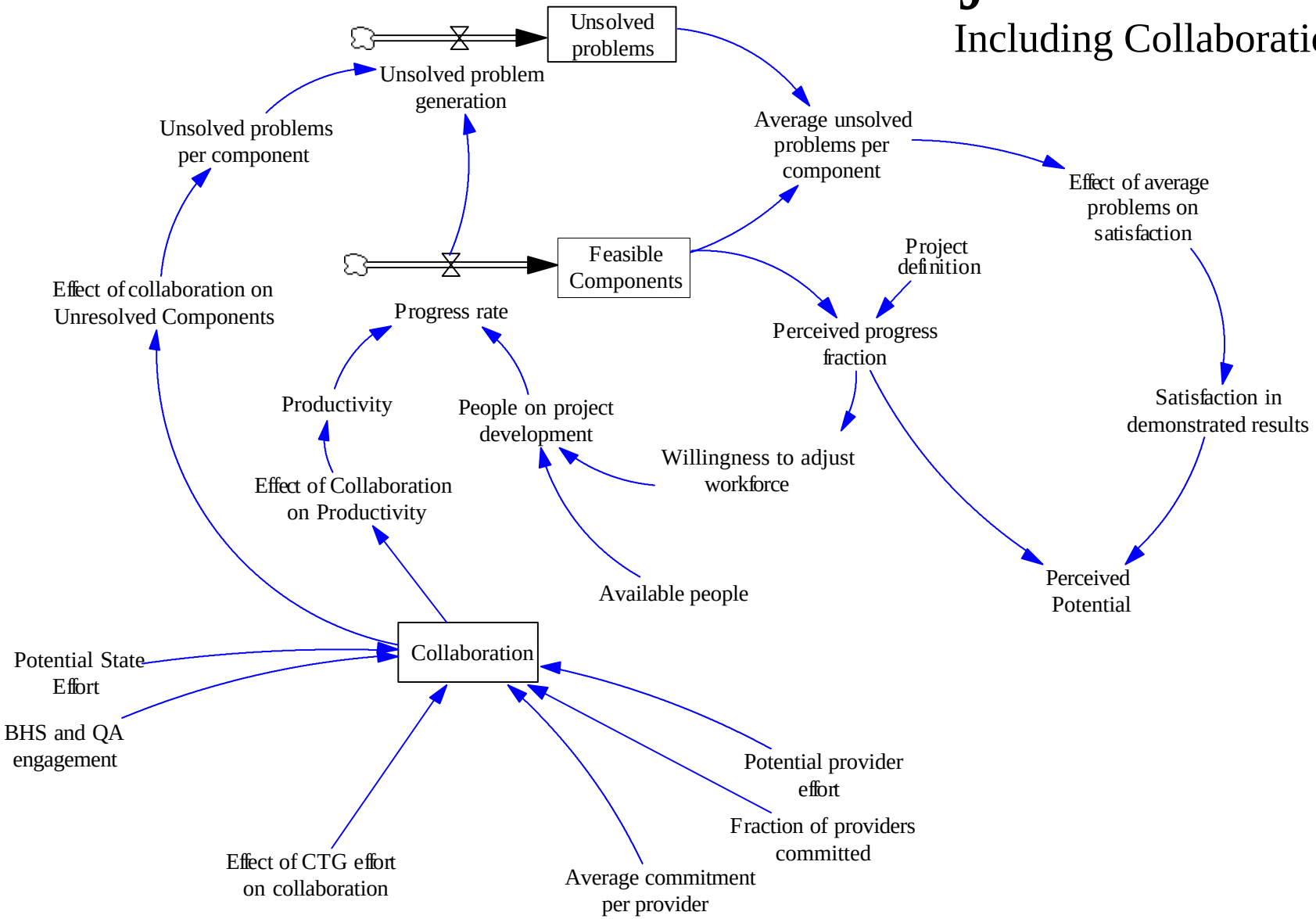


Project Sector

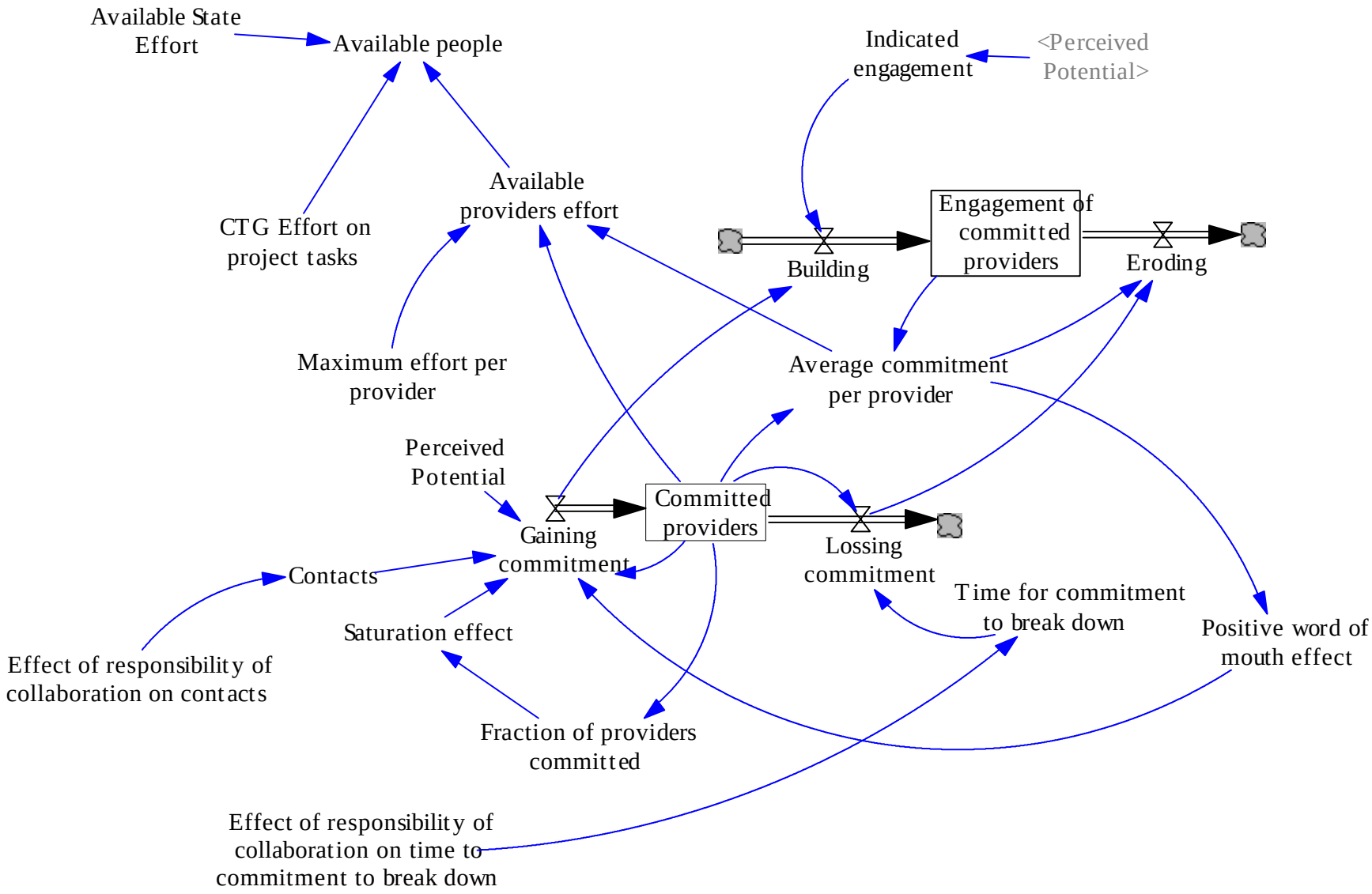


Project Sector

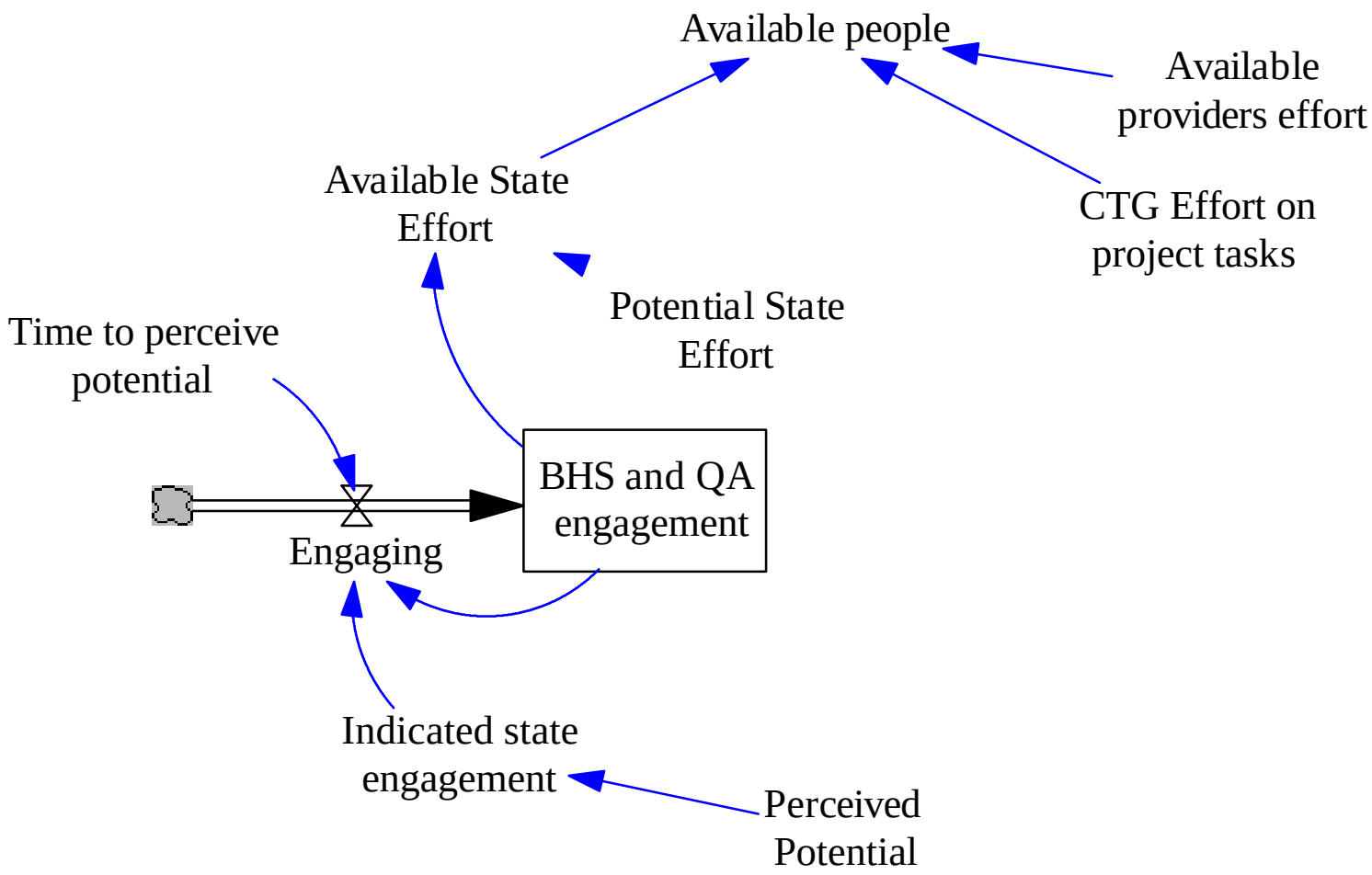
Including Collaboration



Providers Sector

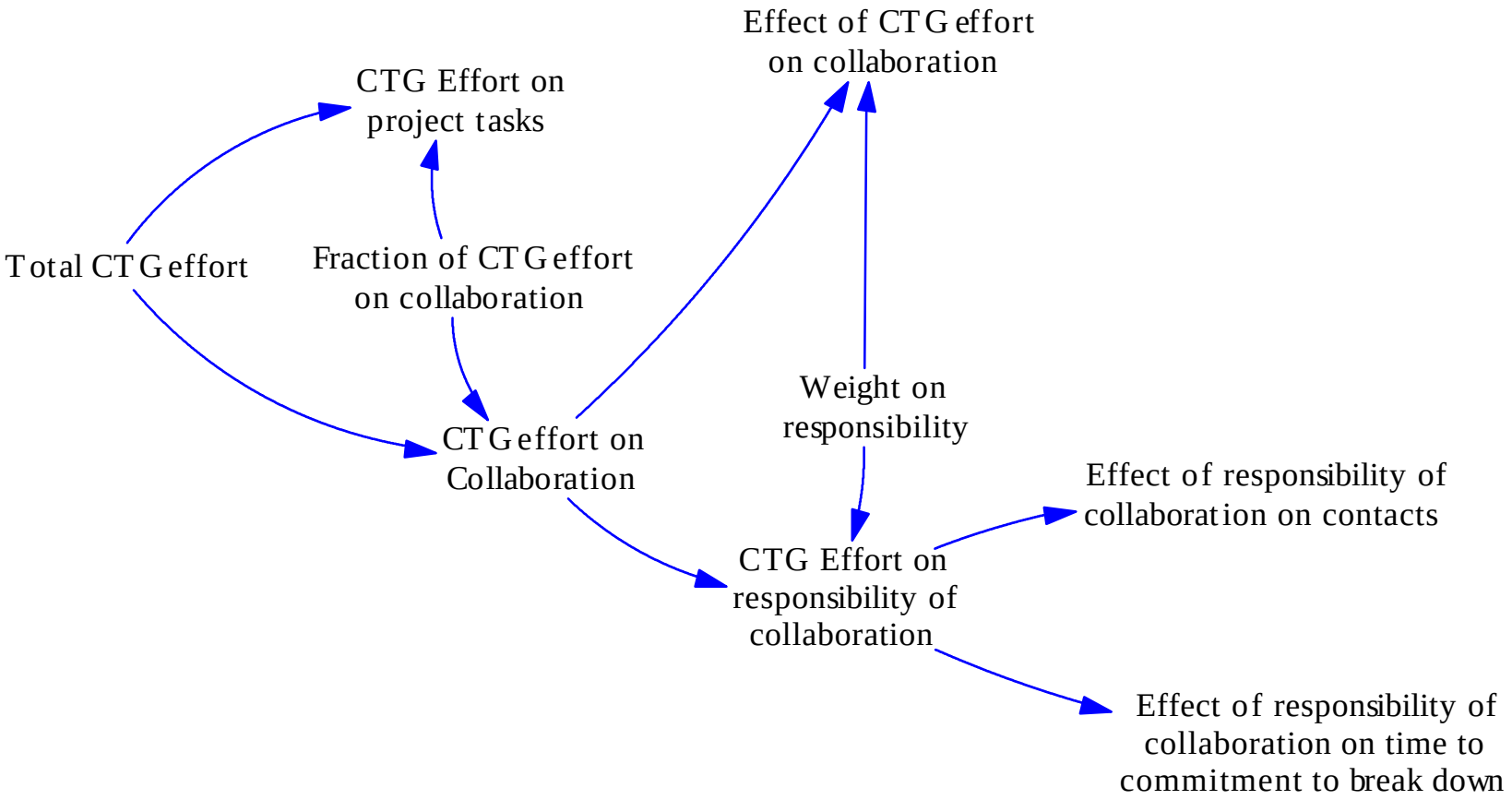


BSS* and State Sector

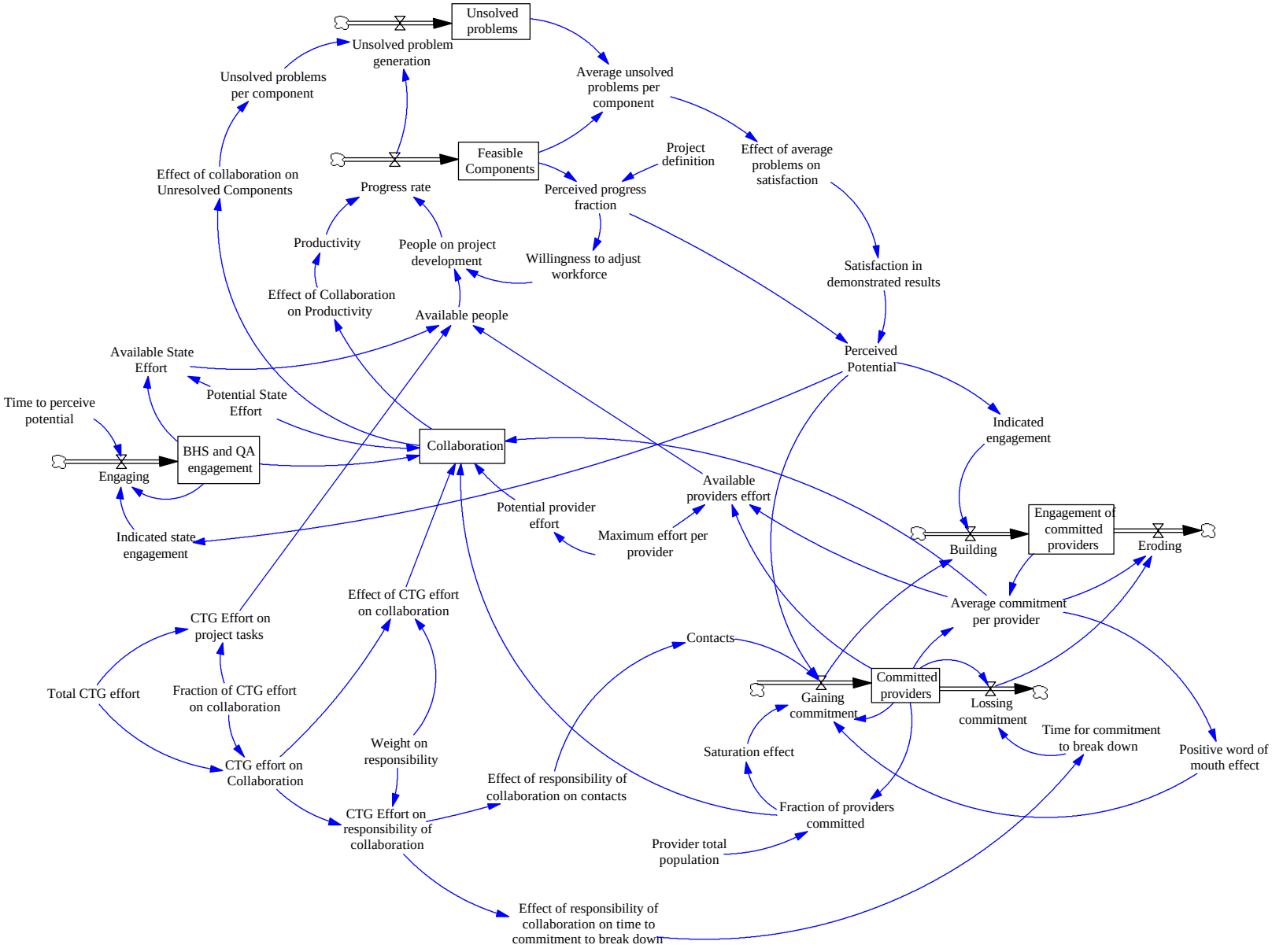


•BSS and BHS stand for the name of the Bureau of Housing Services of New York State. The agency went through a name change during the course of the project.

CTG Sector


Effect of CTG effort on collaboration
CTG Effort on project tasks
Total CTG effort
Fraction of CTG effort on collaboration
Weight on responsibility
CTG effort on Collaboration
Effect of responsibility of collaboration on contacts
CTG Effort on responsibility of collaboration
Effect of responsibility of collaboration on time to commitment to break down

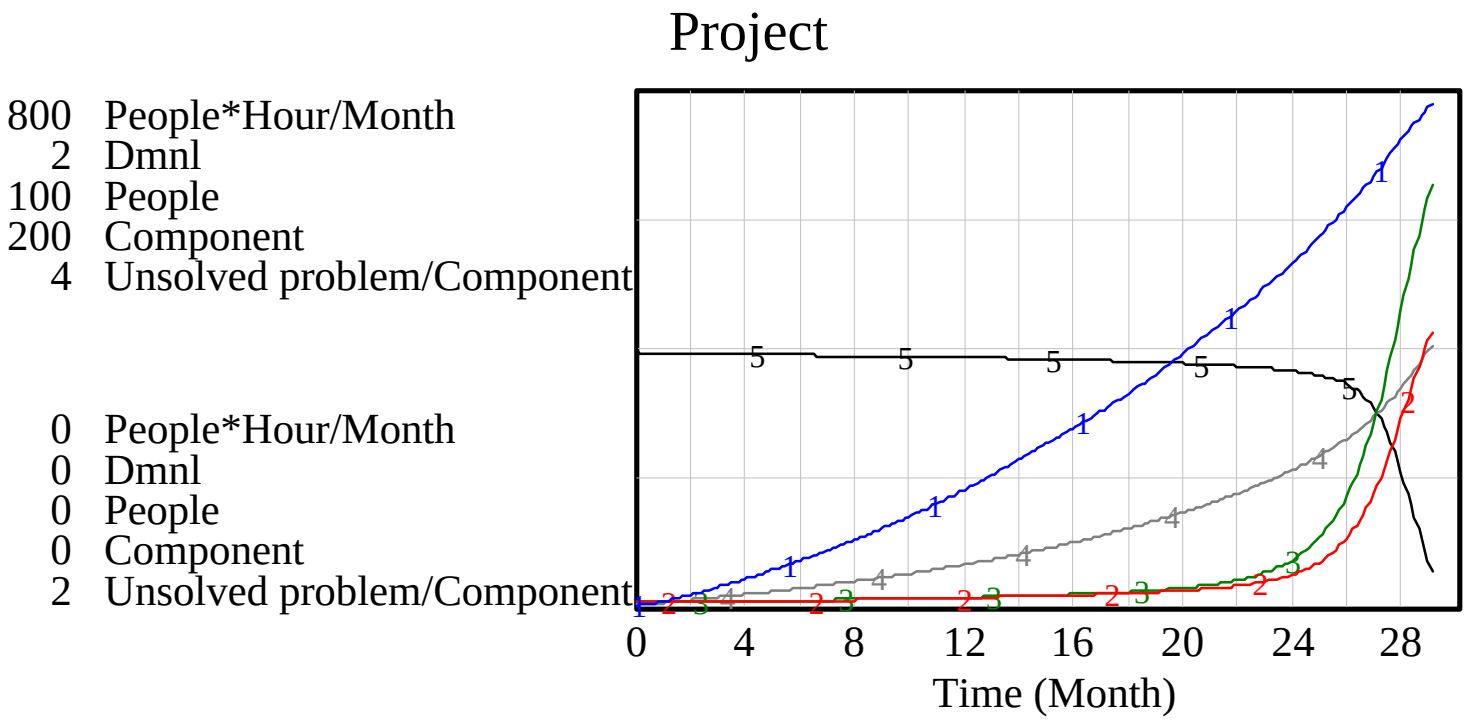
The Complete Model



Runs to be Presented

1. Base Run. CTG efforts on project completion and collaboration are active.
2. Run excluding CTG impact on project completion and collaboration (NO-CTG).
3. Run excluding CTG effort on collaboration only. The CTG effort on project completion stays active.

(1) Base- Run Behavior

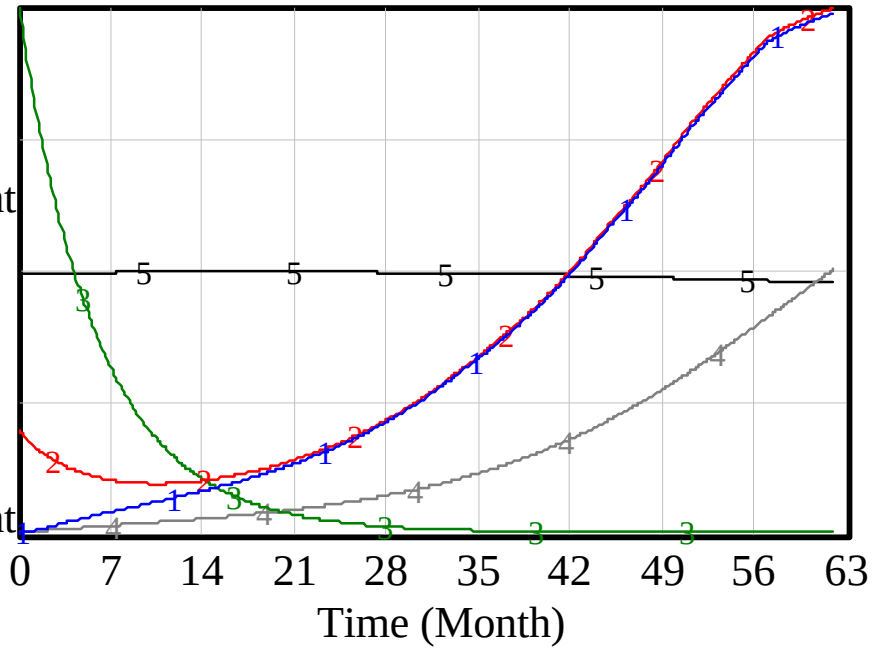


(2) No CTG- Run Behavior

Project

800 People*Hour/Month
0.04 Dmnl
1 People
200 Component
4 Unsolved problem/Component

0 People*Hour/Month
0 Dmnl
0 People
0 Component
2 Unsolved problem/Component

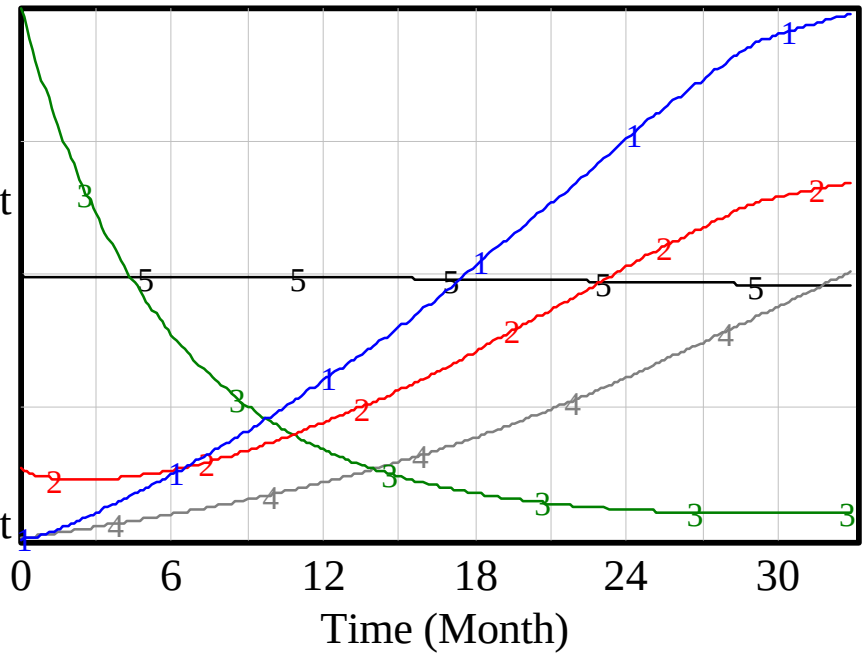


Available State Effort : NoCTG People*Hour/Month
Collaboration : NoCTG Dmnl
Committed providers : NoCTG People
Feasible Components : NoCTG Component
Average unsolved problems per component : NoCTG Unsolved problem/Component

(3) CTG no effort on Collaboration - Run Behavior

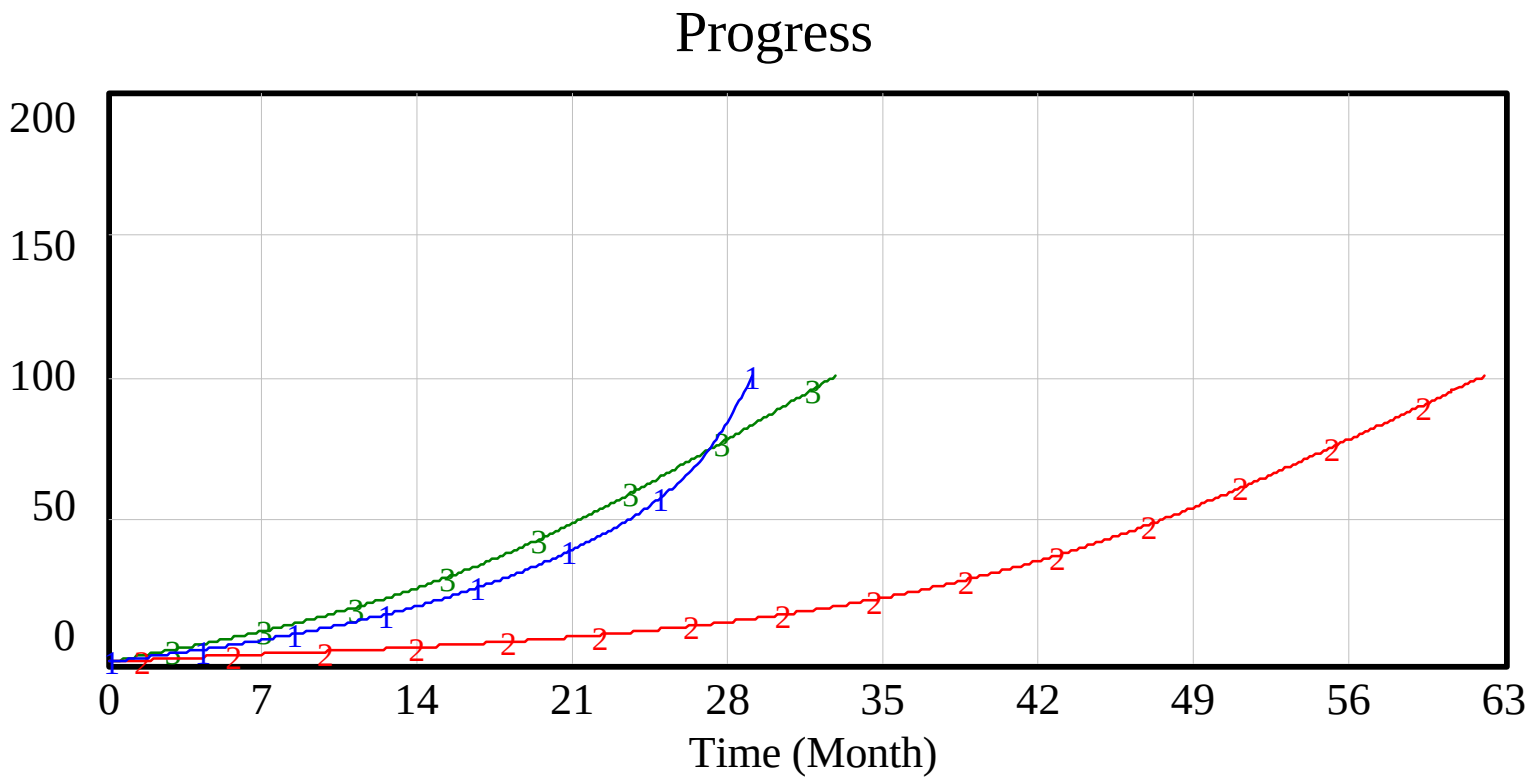
Project

800	People*Hour/Month
0.06	Dmnl
1	People
200	Component
4	Unsolved problem/Component
0	People*Hour/Month
0	Dmnl
0	People
0	Component
2	Unsolved problem/Component

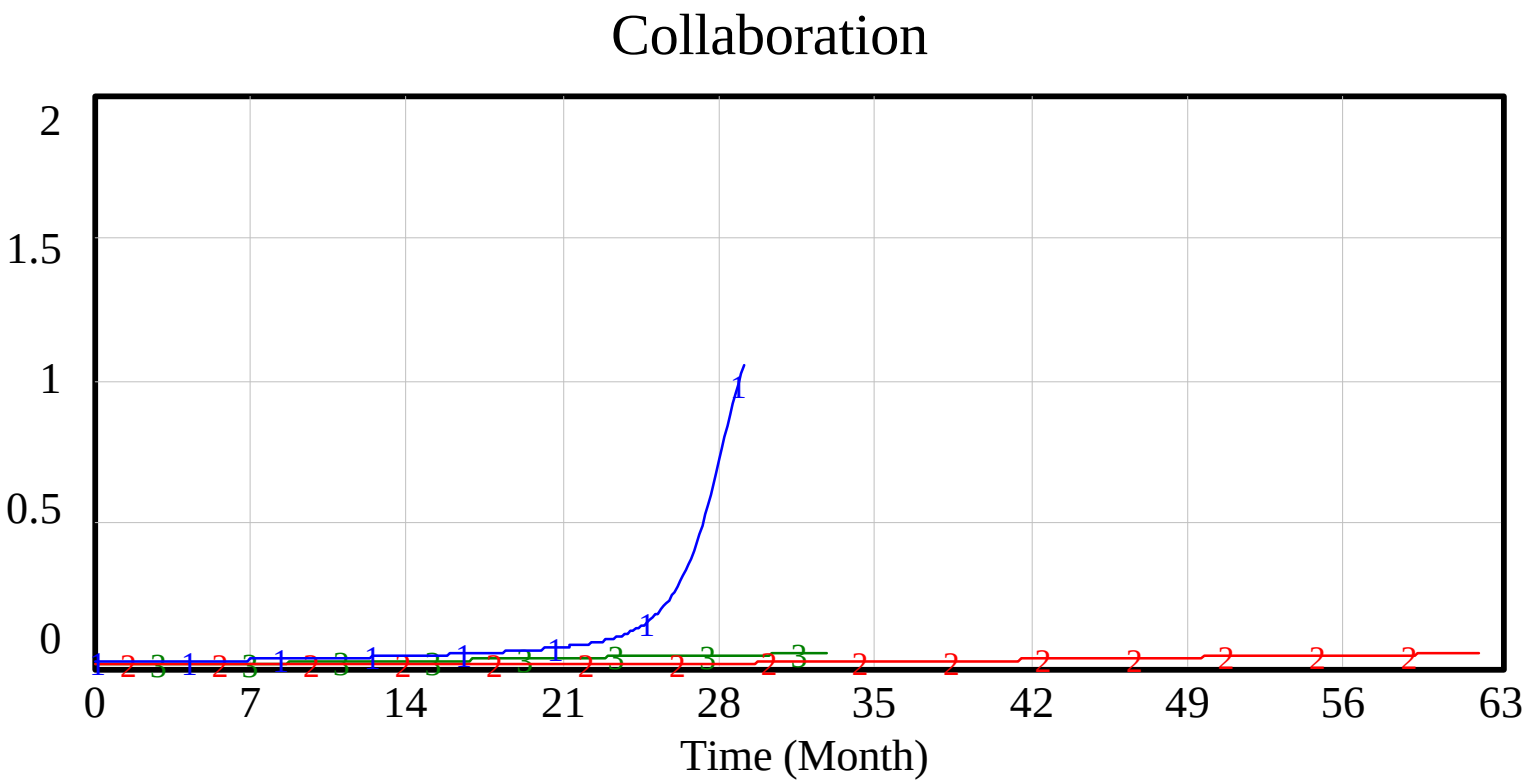


Available State Effort : CTGnoCol — People*Hour/Month
Collaboration : CTGnoCol — Dmnl
Committed providers : CTGnoCol — People
Feasible Components : CTGnoCol — Component
Average unsolved problems per component : CTGnoCol — Unsolved problem/Component

Comparative Plot- Project Progress

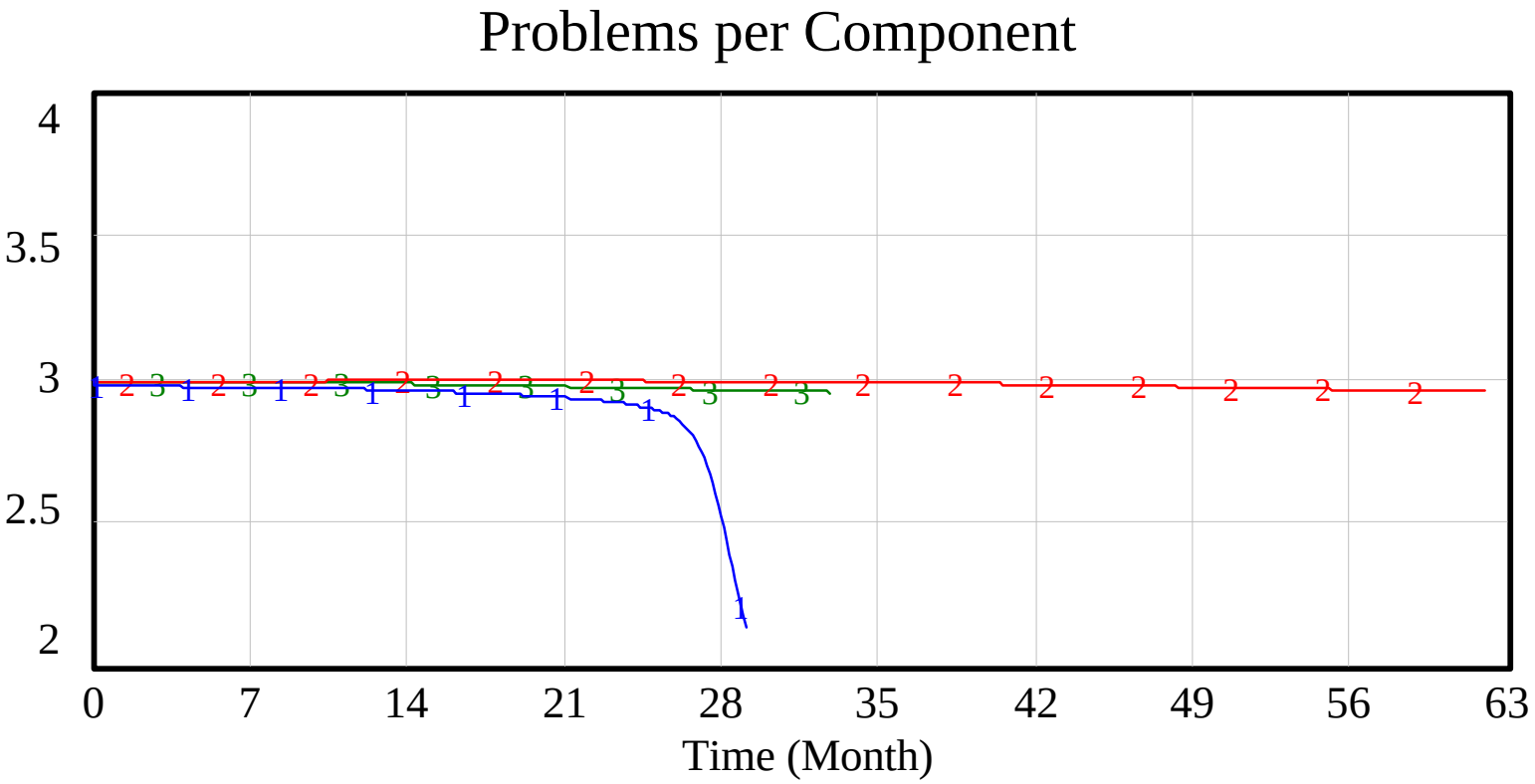


Comparative Plot- Collaboration



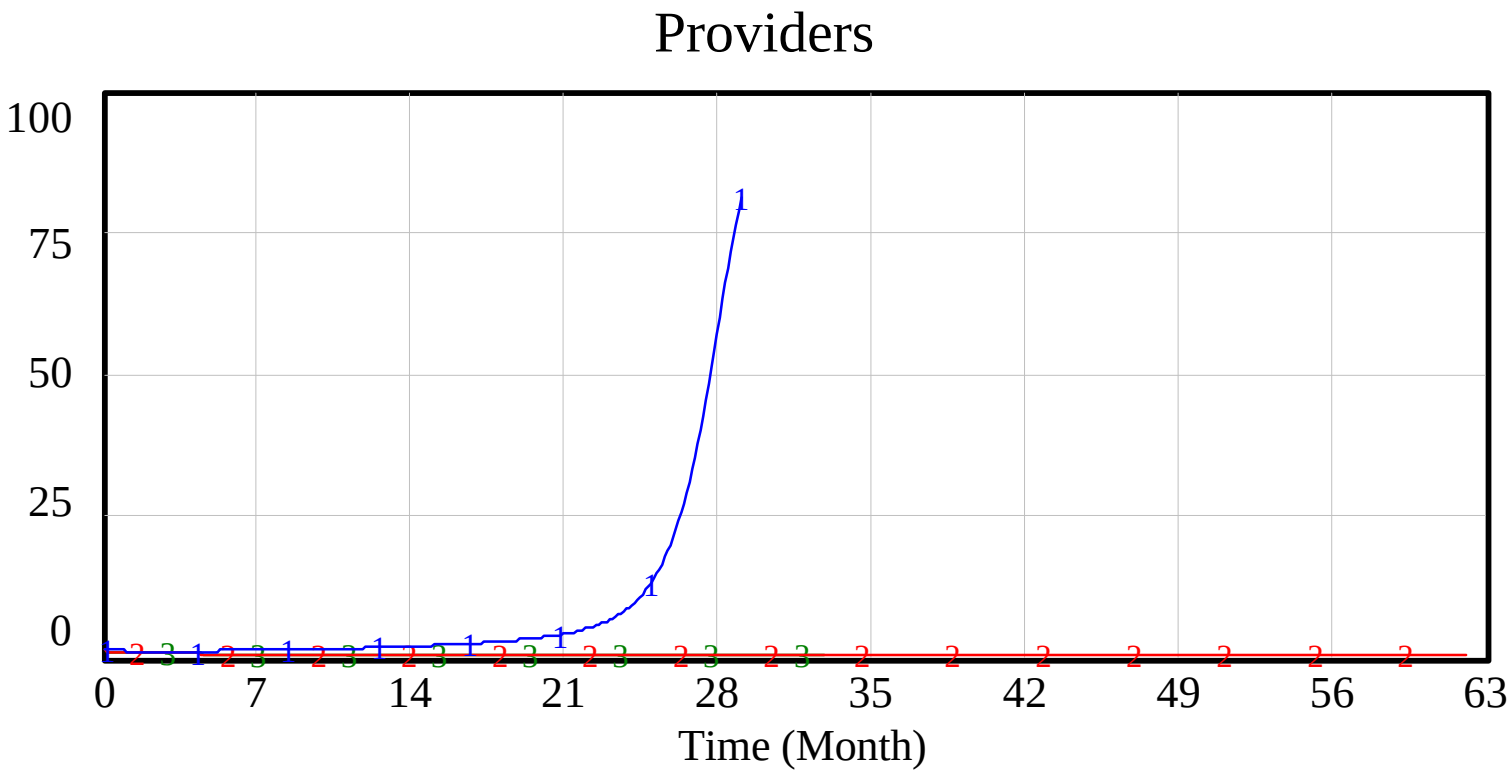
Collaboration : Base 1 1 1 1 1 1 1 1 1 1 1 Dmnl
Collaboration : noCTG 2 2 2 2 2 2 2 2 2 2 2 Dmnl
Collaboration : CTGnoCol 3 3 3 3 3 3 3 3 3 Dmnl

Comparative Plot-Problems per Component



Average unsolved problems per component : Base 1 Unsolved problem/Component
Average unsolved problems per component : NoCTG Unsolved problem/Component
Average unsolved problems per component : CTGnoCh Unsolved problem/Component

Comparative Plot- Committed Providers



Lessons Learned

- **The same feedback structure can generate successful and unsuccessful scenarios.**
- **The dynamics of trust and collaboration are important to project management.**
- **The policies used in runs 2 and 3 show that the way in which collaboration and engagement are managed makes the difference.**
- **Though level of collaboration was not important for project completion, it was important to drive out unsolved problems.**

Future Directions

- **Fix known problems**
- **Add to providers capacity to learn (2)**
- **Explore how CTG allocates effort dynamically**
- **Expand to multi-phase view**
- **Elaborate inputs to effects of and from collaboration (1)**
- **Elaborate trust dynamics (1)**
- **Capture feedback insights from the work (1)**

Known problems of ***TRUST1***

- No way to "*solve*" problems in the model (once you have a problem it stays there).
- "Epidemic" nature of committed providers (all or nothing).
- Satisfaction never takes off.
- Parameter issues.